GLEANINGS IN BEE CULTURE

A JOURNAL DEVOTED TO BEES AND HONEY AND HOME INTERESTS

ILLUSTRATED SEMI-MONTHLY

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STRAY STRAWS FROM DR C. C. MILLER

PROBABLY we'd better not trouble ourselves with the Dickel theory, mentioned on p. 726, but just watch to see how they settle it in "das Vaterland."

A NEW KINK I saw at Omaha was tumblers of jelly with a coating of paraffine on top to keep it from molding. Beeswax will answer the same purpose.

"FOREIGN MATTER in honey-comb," page 730, reminds me that, when I used sheets of enameled oilcloth, I have known the bees to put the black enamel in the cappings of sections.

DOOLITTLE gets more for his honey by sending "fancy" to Smith and No. 1 to Jones, p. 730. But suppose I send No. 1 to Smith and fancy to Jones (a thing likely to happy at any time), then we're both out.

THOSE ROCKY FORD melons were fine, indeed, A. I., but we've been eating nutmeg and banana melons from our own ground for some days, and I think they're just a shade better. I can make nearly a full meal from them. Come and have some.

THERE'S just one objection to friend Greiner's plan of ventilating, pictured p. 726, and that is that the bottom-bars of the upper story will rest directly on the back end of the lower story, and be glued there. But the advantage may overbalance the objection.

THE WEE BEE-MOTH, mentioned page 729, so far as I know does not exist in this part of the country; but a writer in a late foreign journal says that in his region the greater part of the damage done to combs in colonies is by this same moth, although wrongly charged to the larger sort.

ISN'T IT POSSIBLE that T. H. Kloer (p. 732) keeps his Italians hard crowded for room beyond the average, to get them to have a $\frac{3}{16}$ bee-space? If you'll remind us of it in GLEANINGS for June 1, a whole lot will report as to space between combs. [If I do not forget it, I shall be glad to call attention to the matter next summer.—ED.]

YOU SEEM TO THINK, Mr. Editor, that better queens are reared for superseding than in a queenless colony. Well, then, all you have to do is to cage your queen and she will generally be superseded. [But would that be a natural supersedure? Would the bees, if it were not, rear as good a queen?—ED.]

JOHN ARMSTRONG wants me supplied with a machine for cleaning fences, "a small sand-belt for each place to be cleaned." That would be good, but it wouldn't be as cheap as a hatchet for the plain separator, and the hatchet wouldn't need renewing as often as the sandpaper.

W. T. RICHARDSON "has the exclusive right to the bee-pasturage on 12,000 acres," page 723. Now, how does he get that exclusive right? and how does he hold it? I occupy as large a territory, but I've no exclusive right, and years ago I pulled a big lot of trouble down on my head by saying bee-keepers should have exclusive rights. Has Mr. R. bought all that land?

INTERESTING READING is that on page 718, where C. P. Dadant tells the story of their former experiences. Seems like old times to read of honey-boxes with 4 glass sides and 4 corner-posts. But they beat me in the matter of smoke. I had only a burning brand, which I blew with my breath. A. I. Root learned the trick from me, and nearly burned up a colony the first time he tried it alone.

BRO. DOOLITTLE, page 730, talks about my trying to slay him. Tut! tut! I have entire faith in his honesty, and want him to live a long time. He seems to think he's misrepresented or misunderstood. I think not by me. The one distinct thing to which I object is his saying it's right to ship to a commission man buckwheat honey faced with clover, a thing that I know is *not* right "for this locality."

TAKE IT FOR GRANTED that all honey is foul broody, unless you *know* it is not. Any sample of honey that comes to me, no matter whence, is burned if it isn't eaten on the table. [It is our rule, usually, to dispose of samples of honey that come to us from bee-keepers all over the country, who have honey to sell. Very often we take a hundred or so of samples that have accumulated, and toss

them into the furnace. In any event, it is not safe to leave them around where bees can get at them.—Ed.]

It's tantalizing that so many bright bee-keepers in other lands persist in burying their lights in languages so hard to unriddle. Why couldn't they write every thing in plain English? But it's some comfort to know that they're sometimes floored by some of our English expressions. A late French journal, quoting a "Straw" from Gleanings, p. 378, translates the sentence, "Then smoke like sixty till bees rush out of hive," after this fashion: "Then smoke till about sixty bees rush out of the hive"!

"I have sometimes thought that, when suddenly deprived of their mother, they are in such haste to supply the deficiency that they start with any thing they can get," quoth ye editor, page 726. Yes, that's what we've all been taught to think; but are you sure the thought isn't wrong? I think I never knew a *strong* colony made queenless to have a young queen emerge sooner than 10 days or later than 12 days. If you will read with care p. 725, column 2, paragraph 3, I think you will see that in such case the bees *must* have chosen a larva of proper age. [No, I am not sure that the thought is right or wrong. Perhaps your reasoning is correct.—Ed.]

W. A. Pryal, page 729, is puzzled to know why exchanging a paralytic colony with a healthy one cures. The explanation that has been given is that the bees are loath to cast out their sick sisters of their own blood, but the strangers make no bones of casting them out. [I do not see, doctor, why you are puzzled. When yellow fever breaks out, the authorities make an attempt to remove or isolate every case. The bees, instead of isolating the sick ones, simply pick them up and carry them out of the hive. A sick colony left to itself is inclined to let the diseased bees and the healthy ones remain together; but when, on the other hand, it receives an infusion of new blood (healthy bees from another colony), that new life proceeds at once to carry off all the sick, thus removing the cause of infection. —Ed.]

There! just what I was afraid of all the time, that friend Dadant would say as he does, page 719, that two stories of Langstroth frames don't work the same as the big Quinby frames. But his reasoning doesn't apply "in this locality," and I don't see why you don't follow my plan at Medina. Put your second story *under*, and then you'll have it perfectly "contractible and expansible," for the brood-nest will be gradually extended downward. The addition of the second story will make the brood-nest warmer instead of colder. But after the section supers are taken off, I put the second story on top. If I wintered on summer stands, I'd put second story under. [My plan was generally, I think, to put a second story on top. That the brood-nest will be warmer when your plan is practiced, there can be no question. Perhaps your way is better. I will endeavor to try it next season.—Ed.]

General Correspondence

LARGE HIVES.

A Historical Resume; Small Hives Not Advised for Short Seasons; Small Hives, Small Colonies.

BY C. P. DADANT.

In my previous article I told you how Mr. Dadant, senior, came to the use of large hives. I will now explain how he succeeded in introducing them in France, Switzerland, Italy, Belgium, etc., while living in America.

In 1867 a neighbor of ours went to the Paris International Exposition, and my father asked him to get for him the address of the French bee journal, *L'Apiculteur*, which had then been in existence for twelve years. On receipt of the sample copy of this magazine, he discovered that bee culture in Europe was very much behind, the hives in use being the old-fashioned straw skeps. The inventions of Berlepsch, Debeauvoys, and others were too primitive to make movable-frame hives practical. He at once began writing articles for *L'Apiculteur*, advising the use of the Langstroth invention of hanging frames with movable honey-boards, and at the same time advised the use of much larger hives than were then in use. The reader will remember what I said in a previous article, on the capacity of the hives used in France, and of the opinion expressed by their leading apiarists as to the laying capacity of queens. The hives were much smaller than those used here at present, and the results were correspondingly smaller. Bastian, who used a hive similar to the Berlepsch, wrote that there was no necessity for a super containing more than 6 to 12 lbs. of honey.

Thus the ideas advanced by Mr. Dadant, senior, were considered unreasonable, both as to size and shape. Movable-frame hives were fit only for experimenting scientists, and large hives were worse than useless.

It is really amusing, at this date, after a lapse of thirty years, to read the arguments given by the supporters of a dying routine against the new methods which slowly but finally superseded their now obsolete methods. I have before my eyes an article written by my father, and inserted in *L'Apiculteur* of December, 1868, very nearly thirty years ago, in which, as an argument in favor of larger hives and better methods, he translates a report of A. I. Root, given in the *American Bee Journal* for October, 1868. As it is much easier to quote the English itself, instead of retranslating, I will take this passage as I find it in the *American Bee Journal*, Vol. IV., page 64:

"In the spring we selected a strong stock, with a very prolific queen, and first removed every bit of drone comb from the breeding-apartment, and supplied its place with clean straight frames of worker comb; second, we

arranged the second story, as it was a Langstroth hive, so as to hold frames above as well as below; third, the honey was removed by the machine at intervals of from three days to a week, or just before the bees were about to seal it up; fourth, as the swarm soon became very populous we were several times obliged to remove comb from the center, and supply its place with empty frames, to prevent their clustering and 'loafing,' so that they have in reality built several frames of comb, besides yielding us 203 pounds of pure honey up to this date, July 21, and from appearances we think they are not nearly through yet."

Now, what do you suppose the editor of *L'Apiculteur* said in regard to this? He sneeringly wrote: "This figure of Root's reminds us of another. We once read in a publication of the Roret editors, at the time of the effervescence about the 'drawer hive of the Englishman Nutt,' that an owner of this marvelous hive had harvested 1100 lbs. (550 kilos) in one year from the same hive."

So you see, friend reader, how the new ideas were received by a class of men who had been accustomed to consider themselves as the leaders of progress in this particular branch of industry. There was no progress outside of them; no discovery had any value which they had not made; and those who succeeded with improved methods and larger hives were nothing but humbugs, "American Barnums," as Hamet had finally named my father. The honey-extractor was stamped "joujou inutile" (useless toy). It was uphill work to get new ideas started with such a light-extinguisher as the old *Apiculteur* was; but, happily, men of progress were to be found who were willing to listen to plain sense. My father first found listeners in the *Journal des Fermes*, in which he had long discussions on the size of hives with several, and especially with Bastian, already mentioned in this article. Yet Bastian, who was very fair in the discussions, acknowledged that the hive should be large enough to accommodate the laying of the queen, and furnish room enough for the provisions. But Berlepsch and Dzierzon used small hives, and Bastian followed them. In his book he supports small movable-frame hives. Later our good friend Mr. Bertrand began the publication of his most excellent sheet, the *Revue Internationale*, in Switzerland. Then the work of progress began to tell on *L'Apiculteur*. Slowly and steadily the opposition to movable-frame hives and to larger hives than formerly used had to be relinquished; and when Hamet, the stubborn, sarcastic, and unprogressive editor of this sheet died, that was the end of box-hive methods. The Italian bee journal, *L'Apicoltore*, also had entered the field for a better cause, and the works of Dubini and of the late De Layens finished the work.

Doctor Dubini, in his book, page 258, says: "The Americans give preference to spacious hives [remember that Europeans previously used a smaller hive than the eight-frame Langstroth]. De Layens uses a hive with a capacity of 80 liters (80 quarts); many find themselves satisfied with one of 75 quarts. This capacity may be varied by means of a division-board, and thus diminish or increase the number of frames at will, which permits:

"1. To wait till the weak colonies become strong.

"2. To diminish the honey consumption in winter by reducing the room and keeping the heat concentrated.

"3. To help the bees to defend themselves better against their enemies.

"4. To increase the activity of the bees in a good season.

"5. To enable the queen to continue her laying by being furnished with plenty of empty cells.

"6. To agglomerate a greater number of bees for the time of blossoms.

"7. To increase the crop, in complex proportion with the space, the validity of the queen, and the number of worker bees.

"It is a grave error to believe that, in countries where the blooming season is short, small hives are advisable. We hold that small hives give small swarms, which can not gather even the necessary food, much less the surplus, in the short moments that hardly ever fail in the worst seasons, in which the flowering, though of short duration, still is sufficient for strong colonies to harvest a plentiful supply." (*L'Apicoltore*, Dubini, 1881.)

De Layens also cites the Americans as using large hives. His views of America are taken from Mr. Dadant's writings and from those of father Langstroth, whose book is now well known in Europe through the translation made by my father. The Dadant-Langstroth and the De Layens hive are now about the only hives sold in all the French speaking countries; and the *Revue Internationale* periodically publishes statements showing a great difference in results in the comparison of these hives with smaller types all over French-speaking Europe.

Hamilton, Ill.

[As I have several times said, history repeats itself. As there were, years ago, advocates of small hives, and opposers of large ones, so we have them to-day. I may, some time in the future, change my mind; but I can not help thinking that more *money* can be secured from a large colony in a large hive. But a large colony in a small hive or a small one in a large hive, will accomplish little more than a big cart-horse pulling a baby-cab, or a dog trying to pull a lumber-wagon. The two "larges" must be hitched together, and then we have a team that will do some work.

I note that Dr. Dubini says that "it is a grave error to believe that, in countries where the blooming season is short, small hives are advisable." While I think there is a great deal of truth in it, I do not go so far as to deny or affirm the proposition.—ED.]

CRAYCRAFT'S BEE-SHED.

Importance and Convenience of Shade in Florida.

BY JOHN CRAYCRAFT.

Having learned by experience that a compact placing of hives under a shed is an indis-

pensable adjunct to practical bee-keeping in Florida, I hereby send you a ground-plan of my apiary of 112 hives, and also a small picture of the outward form and manner of locating the hives. The shed is octagonal, each side being 16½ feet on line outside and with front of hives, except the two angles running up to the shop and extracting-room.

The shed is cheaply constructed. The posts are 3x4 inches, and rest on pine blocks. All the other timbers are 1½x3, using this size for rafters, ties, and roof-strips to nail the boards on, which are of cypress, 5 feet long, making the shed about 8 feet wide, so that my hives will lean back about a foot, leaving a walk 3 feet wide, as my hives are all 16 inches square, outside. But for the Langstroth hive the shed should be roofed about 10 ft. wide, so that the hives could be placed back under the shed about a foot, leaving about a three-foot passage. For ease of handling, the entrance to hives should be at the side, so that the operator can work from the side instead of from the end of frames.

I give no details of material to construct such a shed, as any mechanic can make out that. In regard to the form, it is very compact, and a walk around under the shed will show at a glance where attention may be required; or a step into the passage leading into the inner court will show the section of a swarm issuing. All the work is done from the back of the hive, with very little annoyance from bees coming and going; and, besides all this, I have all supers right up over the hives on the framework, or I can set extra hives for queen-rearing up under the eaves of the shed, as there is sufficient space there so that I can place as many nuclei as I have hives below, which is 112.

I place my hives on four stakes driven into the ground about six inches, and leave about four inches above ground, so that the hives stand four inches high. I have what I term an "apron" to reach from the entrance to the ground, made of a thin board about six inches wide, and as long as the hive is wide. I bevel one edge to an angle of about 45°, and tack to the hive, letting the other rest on the ground so that, if it warps, it will keep its place to the hive. This is a great help to weary bees. Where something better than stakes is desired, four bricks set on end four inches in the ground, in true mechanical order, are pleasing to see.

I am unable to see how I ever kept bees so long before building this shed. I can continue my work, rain or shine, often working bareheaded, without gloves or veils, doing a great part of my manipulation sitting, as I have several stools around the shed. A shed of this form is far superior to a vine or tree. The shade is always where you need it, and the hives will be always dry and clean.

Astor Park, Fla., Aug. 3.

CRAYCRAFT'S BEE-SHED, ASTOR PARK, FLORIDA.

FULL SHEETS VS. STARTERS IN SECTIONS.

Comb Honey Better in Flavor than Extracted, and Why; Worker Cappings Prettier than Drone.

BY F. GREINER.

It was with a great deal of satisfaction that I read friend Aikin's article on the use of comb foundation—in particular the part that touches upon foundation in sections. It is just exactly for the reason that honey built upon foundation is not equal to the natural

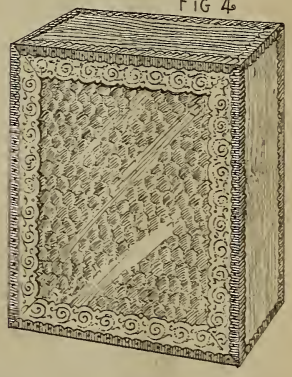
product for "tenderness and fine edible qualities" that I have always been opposed to the use of foundation in sections, except for starters. It does me good to find occasionally a bee-keeping brother who thinks as I do on this subject, and has the courage to say so in public. I am pretty well satisfied that it pays to use full sheets in sections in order to get the combs well attached to the wood, and sealed all around, and also to get a larger yield generally; but it seems to me that the one thing of greatest importance in the production of section honey is not so much to have the combs solidly attached and sealed all around as to produce an article possessing the finest edible qualities possible.

The ardent writer who, some time ago, told his brother bee-keepers who produce such honey as was pictured on page 128, Feb. 15, top tier of plate, "they had better soak their heads and brimstone their bees," has shot far over the mark, and I very much doubt that his honey is anywhere near the fine quality that I like so well in the comb honey for my table. I consider it immaterial whether the comb is attached to the wood or not, if the kind and the quality are right, the comb delicate, and of a melting character. Once in a while I have had whole supers filled with fancy honey, sections all well filled, combs built out squarely into the corners, and still not attached to the wood except along the top, and perhaps a brace or two at each corner. A flake of such honey is indeed a beauty when it appears on the table, for it need not be mutilated by the knife in cutting it out. I do not imply that it would be prudent to aim to produce such honey, because it would not carry well; but I believe it would attract just as many buyers if we could get it into the market.

It had not occurred to Bro. Aikin that worker comb in the finished product looks any better than drone comb till he was told by some one, and now, he confesses, he does not know it yet. That, of course, is a matter of taste; but to the great majority of bee-keepers and honey-consumers, worker-comb honey looks much the prettier. I can detect but little difference in the edible qualities of the two. No, I have not measured the thickness of drone comb, and compared it with that of the worker comb; but I have eaten both kinds often; and when they were built out under the same conditions the difference has appeared to me infinitely small. However this may be, I should be glad if I could induce my bees to build more worker comb in the sections. So many bee-keepers use full sheets of foundation, and their product is so very uniform and well built out, that I have been tempted many a time to do likewise. This year I filled all my sections about half full of extra-light section foundation, but with a result I am any thing but pleased with. I am sorry enough to have used so much foundation. I have gained the point of more uniformity, but the gobbiness of the upper half of each comb is beyond endurance. Wife says, "Don't bring any more such fishbone honey up to the house." No more foundation for me! However, this does not include the new drawn foundation, which I have not yet fully tested. From its fragility and delicateness, I think it has a promising future providing the price is not prohibitory.

Aside from having our sections filled with all worker comb, they may be made more attractive by glassing them and then trimming with colored paper. Before we adopted the one-piece section, which is not well suited for glassing, we did a great deal such work; and when we wanted to do a very fancy job we used paper lace in connection with the colored paper, as shown in the accompanying drawing.

FIG 4.



We almost always obtained a higher price for such "fixed-up" honey; and the glass, being sold as honey, paid for the work. The glassing itself was a very simple operation. I would say the sections we used were four-piece nailed, the glass fitting in between top and bottom pieces, which projected over the sides ⅛ inch on each side, or about the thickness of the glass. We used common glue to fasten on the glass. After being cleaned from propolis the section was placed on the table flat, dropping just a little glue on the edge near each corner of the narrow sides; the glass was adjusted, and the section turned over. However, it had to be laid on two little sticks a trifle shorter than the glass was wide, and about ¼ inch thick. The object of this was to have the weight of the box press the glass tight against the wood. The other side of the section was now treated in the same way, placing a drop of glue near each corner, and laying on the glass. Two more short sticks were placed on top of the section, ready to receive the next section. So they were piled up eight or ten high with these sticks between, and left so till the glue had hardened. As glass varies in thickness sometimes, we found it necessary to trim off any superfluous wood projecting over the glass with the knife. The boxes were then ready to be given the finish. Gum arabic being colorless, we found this to be the best for sticking the paper to the glass and wood.

With a suitable pinking-iron we prepared the necessary paper strips and cut them the proper lengths to just go around the boxes. We then bound the edges as shown in the illustration, making a very neat package. Of

course, it was a great deal of work to do all this with several tons of honey each year, but we did much of it evenings. Children and all helping, we could turn out quite a lot in one night. The crating had to be done by daylight the next morning. One can not well grade by lamplight.

The people hereabout must be different from what they are with Bro. Aikin, for I find but few who like their honey without some wax. Indeed, I do not know one person who prefers extracted honey to that in the comb. It is my opinion that honey out of the comb soon loses that fine aroma peculiar to it when in the comb, or when first extracted; and after it has granulated and is liquefied again, all the fine qualities it had once are then gone, even when the liquefying has been done with the greatest of care. My faithful better half, for instance, dislikes liquefied honey, while she rather enjoys the new article. Thus our experience is contrary to Bro. Doolittle's, who recently made the claim that extracted honey improves by liquefying.

PLAIN SECTIONS SATISFACTORY, BUT NOT PERCEPTIBLY BETTER FILLED OUT THAN THE OLD STYLE.

My plain sections are not filled perceptibly better than the others, but we have had a very scant honey flow all around, and of short duration at that. The cappings of the sections used in connection with the fence are perfectly level, except in a few instances where a space in the fence had by accident become wider than the two-twelfths inch. Here I can notice a slightly wavy appearance. I am more favorably impressed with the plain section than I am with the fence, although the fence works all right. I intend to use whole cleated separators by the side of the fence, and in the same cases, too, in order to be better able to determine more correctly how far the fence may be relied upon as giving us better-filled-out sections. I find there is not any more danger of injuring the plain section in handling than the scalloped. If there is any difference it is in favor of the plain. They have no projections to catch into the next section. It may be necessary to use followers with them in the shipping-cases, for it is difficult to get the first sections out of a crate without this convenience.

Naples, N. Y., Aug. 10.

[We down here in Ohio do not know of any method whereby worker comb can be generally secured from a mere starter in the section box. Over half of the combs will be finished drone, and these will be more "gobby" eating than comb honey from full sheets of worker foundation. Or, to put it another way, if we use only starters we shall have more drone than worker; and natural-built comb is less friable than worker comb from full sheets of foundation.

It is possible that honey, when extracted, loses some of the delicate aroma that it has while in the comb. Wax of itself has a beautiful aroma, even when there is no honey in it. Over and over again, persons when visiting our wax-room call attention to the beautiful honey flavor that they smell, notwithstanding there may not be an ounce of honey in the room. Now, then, if wax has a flavor or aroma peculiarly its own, this, when added to honey, would give a combined effect that is pleasanter to the eater than the same honey free of wax.—Ed.]

THE ARENA; THE COMBAT BETWEEN DR. MILLER AND MR. DOOLITTLE.

Large Entrances vs. Small Ones; Some Interesting Observations Regarding the Internal Temperature of Brood-nests.

On page 623 I am informed by Bro. Doolittle that not only am I to be driven from the arena along with a sympathizing friend, but the arena itself is to be annihilated. Before he gets through, Bro. D. informs us that the editor, "true to his manner of always being with the man who can shout the loudest," "has already climbed away from Dr. Miller's side in his haste to get over on the other side." I suppose, however, the fence is still left. Being left friendless and arenaless, how am I to make any further struggle, with only a fence as a field on which to operate? Hardly worth while to try.

After he has smashed the arena, leaving me dangling on the fence, he apparently fits up another arena on which to knock me out as to Nature's plan and things "along that line" in spring. Allow me to ask here, by way of parenthesis, friend Doolittle, whether you think it's just the right thing, when the editor agreed to furnish "the arena," for you to smash his property without paying damages for the same.

I raised the question whether Nature's plan was wrong, and now you raise the question whether I have the right conception of what is Nature's plan. I hadn't supposed there would be any dispute between us as to what is meant by Nature's plan, but I'm not so sure of it now. By Nature's plan I meant what the bees would do if left to themselves without any interference on the part of the bee-keeper.

You ask, "Where are the *first* eggs deposited—in the center of the *cluster*, or on the outside of it?" and then you make me reply, "In the *center*, always." I wish you wouldn't make me say that, for it isn't true. Likely, however, you mean in the spring, in which case the answer is all right. Then you say, "Then that's Nature's way, is it not?" Certainly it's Nature's way to have the *first* eggs there, for that's the only place warm enough at that time; but it isn't Nature's way to lay any more eggs in the center for the next three weeks. It's Nature's way to let those eggs stay right there in the center till they become larvæ and mature bees; and if any intermeddling bee-keeper comes along pulling the frames apart and putting an empty comb in the middle he is making a distinct interference with Nature's plan. It's Nature's plan to lay eggs anywhere in the brood-nest that's warm enough; and I don't need to prove, as you suggest, that the queen would naturally lay

the first eggs of the season on the outside of the cluster. It's Nature's plan to lay the *first* eggs of the season in the center, and it's just as much her plan to lay the next further out, and then further still as the brood-nest increases in size. At least, that's the way it's done in colonies left to themselves in Northern Illinois.

Whether interference with Nature's plan is a good thing or not is another question. I don't know. In your hands it may be all right. If beginners are advised to spread brood, in most cases I suspect the results would be mischievous.

Returning to the matter of entrances, you say you tried ten with entrances 1½ inches deep, and ten with ½-inch entrances. It would have been more to the point if you had tried the four blocks; but as far as you went the proof was in the direction of establishing the fact that, the larger the entrance, the more swarming. It would have been more satisfactory if you had given us the result as to the remainder; for if the three you mention were the only ones that swarmed with the large entrances, and the other ten all swarmed later, then the sum total of the proof lies on the other side. But you certainly can not expect to establish a general principle on the say-so of those three colonies.

My observation agrees with yours, that bees with a large entrance either alight directly on the cluster or else run along the floor till they strike near the center of the cluster.

Yes, distinctly I understand that fanning cools me, and that it's hotter on a sultry day when the train stops; but I don't see what that has to do with the question, unless you mean that bees cool their hives by fanning—a thing I never thought of disputing. But if you want me to believe that they can do better work fanning with a small than a large entrance, you must offer some proof other than the bare assertion. I don't say I know you're wrong, but I'd like to know you're right. If the bees can take in air at an entrance half an inch deep, and then by good engineering drive it out through the same opening, I don't see why they couldn't do it a little more easily with a deeper entrance, or with an entrance all around.

You say the sections immediately above the large entrance were slower in being finished, and cite my objection to upper back entrances as explaining why. I suppose because cooler; and if it's cooler for the sections, isn't it cooler for the bees? And if cooler at the top of the hive in front, doesn't that help to make it cooler all through the hive?

I made some tests with the thermometer. Except as to one point, I don't know that they do any thing to help settle the question; but it may be of interest to report them. I tacked on a strip over the entrance to a hive, making it not more than ½ inch deep, and I stuffed a roll of rags into the other three sides, alternately trying a thermometer with these three sides open and shut. Putting the thermometer on the bottom-board, with the sides all open, the temperature, Aug. 25, 9:15 A. M., was 87°, while outdoors it was 73°. At 9:45, with sides shut, it was 89°. At 10 it was 84½° open; at 10:30, still open 79½. This lowering of temperature was, likely, owing to the larger number of bees being afield, leaving the cluster less dense below. At 10:50, shut, the temperature was 91°, the outdoor air being about 15° lower.

This shows that closing the sides made the hive warmer, but there may be nothing conclusive about it. The weather was not hot, and the temperature in the upper part of the hive may not have acted as it did below.

In the afternoon, the outside air being about 80°, the thermometer was placed on top of the brood-frames. At 1:25 P. M., with the sides shut, the thermometer stood at 90°; at 2, open, 91°; at 2:30, shut, 92½°; at 2:50, open, 92½°; at 4:55, shut, 91°; at 5:20, open, 91°.

Now, if you can draw any satisfactory conclusion from that, you can do better than I can. At 2:30, with the sides shut, it was 1½° warmer than when open half an hour earlier—clear proof that it's warmer with the sides closed. But at 2 it was 1° warmer with the sides open than 45 minutes earlier with the sides shut—clear proof that it's warmer with sides open.

Aug. 30 was hot—91° in the shade. With the thermometer on the top-bars I took observations every 15 minutes, beginning at 2 P. M., having the sides alternately closed and open. The result was as follows: Shut, 96½°; open, 97; shut, 98½; open, 99½; shut, 99½; open, 99; shut, 98½; open 98; shut, 97½; open, 97. The outer temperature had gone down to only 90° at the last observation, and it looks very much as if some other influence or influences were at work controlling the temperature, without paying much attention to whether the sides were open or shut.

Sept. 1 was another hot day, and I dropped the bulb of the thermometer into the middle of the brood-nest. Result was no more satisfactory. Temperature was lower in middle of brood-nest, however, the highest being 97°, at which it stood at 11 o'clock, whether the sides were open or shut. The outer air was then 88°; and when it went up to 91 outside, it went down to 95 inside at 2 P. M., then rose to 96 at 2:25.

Evidently, it isn't an easy thing to prove any thing by the thermometer—at least, for me to do so; and I may as well say frankly that I supposed it would do a good deal to settle the question. Just as frankly I may say that I wish, Bro. Doolittle, that you could give clear proof that your view is right. I'd be glad to believe it, for it's some trouble to hoist a hive on blocks, and would be a good deal easier, and in some respects pleasanter, if the hives could remain unchanged throughout the season. But I can not believe that it is easier for the bees to change the air with a small entrance than with it open all around. If there were a hole at some other place, so that the air were forced through, something on the principle of a tube, then I could easily believe that any side opening might spoil the tube. But in the present case there's nothing of the kind. The air is driven out at the same

place where it is drawn in, and I can't see why it wouldn't be easier to drive out the air at some other place.

Your three swarms are good argument so far as they go, but others say differently. If I remember correctly, Rev. W. P. Faylor says he has no swarms with his hives blocked up, but does have them otherwise.

You say that in extreme heat you had larger clusters outside with the large than with the small entrance. Yesterday, Sept. 2, was an extremely hot day. At the Wilson apiary, part of the hives were raised on blocks, and part had the bottom-boards reversed, with more room under the hive, and a larger entrance, but the sides and back part closed. My assistant called my attention to the fact that those with the sides and back closed were about the only ones hanging out, notwithstanding they were less crowded for room inside. Can it be that your bees and mine are prejudiced by our own views? or do we both look through colored glasses? I may say that, when I tried having the sides and back open and shut, the same colony showed little difference in the matter of hanging out.

You say the bees don't get outside because it's cooler, but to get out of the way of the fanners, "for in reality it is cooler inside." That's a point there ought to be no difficulty in settling with the thermometer. So far as I have tried it, the temperature was always five, ten, or more degrees higher in the hive than outside. When it was 99° on top of the brood-frames, it was only 91° outside. The only case in which your statement could be correct would be with the sun shining directly on the outside cluster; but I think you will find that the outside air is always cooler than the air in the hive. How could it be otherwise? The fanners are always bringing in air from the outside, and the activity of the bees produces heat, not cold. So the air is made hotter and not colder. If the outside air were hotter, the fanners might stop their work, so far as heat is concerned.

You wonder if I ever heard of sections melting down where there was not sufficient ventilation. Yes, I have; and if the outside air were not cooler, ventilation would not help the case any. I hope this whole question will be so thoroughly ventilated that it will no longer remain a question.

Marengo, Ill. C. C. Miller.

[G. M. Doolittle replies.]

Dr. Miller kindly sent me the above, and thus I have a chance to say what I wish in reply, and then this matter can be closed up in one number. As my time is very limited just now, what I say must be brief. About that "arena," I don't like to "fight," anyway, and I thought that the best way to stop the fight was to "smash the arena;" then if the editor wants damages let him charge it up to Doolittle, Miller & Co. But "I don't know" that the smashing of the arena will stop the fight, for I see that the peaceful doctor can fight to fully as good advantage "dangling from a fence" as he could in the whole spacious arena. But *I'm bound* to stop the fight, and so with a few parting words "I'll hie me away" from both the fence and the spot where once stood the glorious (?) arena.

As to Nature's plan of brood-rearing, I shall still hold that, where the queen will deposit eggs *every time*, right in the center of the cluster of bees, unless that center is occupied with something else, that is Nature's plan for egg-laying, Nature telling the queen "to deposit her eggs where it is the most conducive to their comfort; and when it comes about, by an expansion of the brood, that just the right thing can not be done, then do just as nearly right as circumstances will allow." I think that even Dr. M. can see this point, so I will not enlarge further upon it. Allow me to add, however, that, when no brood or honey is in the way, any queen always lays her eggs in the center of the cluster of bees, whether the queen is young or old, or whether the season is early spring or late summer, according to all of my observations.

As to large entrances: Dr. M. says, "It would have been more to the point if you had tried the four blocks. Perhaps it would; but why should I try them over again, when I told you that was tried years ago and found wanting? Then there was the Weeks hive, with its swinging bottom-board, which, by means of a button, caused the bottom of the hive to be shut, all but an entrance ½ by 3 inches, at all times but in summer, when, by turning the button again, the bottom-board was suspended by four wire hooks 2½ inches from the hive. This, and hives raised on inch blocks at the four corners, were tried, with hives having only ½-inch-deep entrances, by the whole length of one side of the hive; and the summing-up of the season's work proved neither of the former superior to the latter as to amount of dollars and cents produced, or as to non-swarming success. Then why should I go all over the ground again that I might be "more to the point"?

About the "say-so" of the three colonies which had large entrances, and swarmed before any of the other seventeen tried to prove which was better as a non-swarming device, the Pettit system or the common entrance, allow me to say that it happened thus: Before I expected any swarms at the outapiary, the man owning the ground on which the bees stood informed me that the bees had commenced swarming, three swarms having issued. I had told him to mark the hives which swarmed (the queens had their wings clipped, so swarms could not go off), and when I went to look after the matter the three hives marked were of the ten with the large entrances. I then went through the whole twenty to stop all swarming, and found that all of the other 17 had made preparations for swarming, but the three which got the start of all the rest were those with the *large* entrances. I don't claim that large entrances *promote* swarming, but I do *claim* that they do not *retard* swarming, much less tend toward *non-swarming*, and this claim is based on years of experience with both.

Now, Dr. M., I don't know that I can prove any such thing, consequently am not going to try; but from the hours I have lain beside hives with swinging bottom-boards and those with large entrances, and seen the lack of "fanners" at work, unless those fanners were away up in the hive, I have formed the opinion that the fanners could do more effectual work at the half-inch entrance than they could where they had all outdoors to send a "current of air through."

I am very glad indeed to get your tests with the thermometer; and while they do not prove very much to sustain either your side or mine, one thing they do prove, which is that at *no* time did the heat inside of the hive get very much above that which is very *comfortable* for the bees. You ask how I know. Well, don't you remember those experiments I tried, to get at the right temperature for brood-rearing, and how, on one morning, when there was frost on the ground I found the temperature in the brood-nest to be from 95 to 97°, and in all of the tests made that the range in the brood-nest was from 94 to 98°? And here we have been having a whole great big "arena" fight, with the ground all covered with "fur and blood," all for the sake of something under which the bees are very comfortable, and that which they maintain, even on a morning when the frost is on the ground.

And now, asking your pardon, doctor, for any thing I have said or done which may appear to any looker-on as ungentlemanly or unseemly, I wish to say that, after spending weeks, were the time all put together, and perhaps months, in raising hives and putting them down again, and hours of thought on this matter of more ventilation and larger entrances, the bees have told me by the *products* they have made, that, over and above a half-inch entrance the whole length of the hive, not one pound more honey will be produced, for the average of honey taken with such entrances has been fully equal to that taken with any larger entrances. This being so, I have come to the conclusion that you and others may continue raising hives on four blocks, use the Pettit wedges, yea, suspend your hives in "mid-heavens," for the fun of it, or from any theory advanced; but as for Doolittle, he'd rather spend the time in something more profitable; for it has come to such a pass with me that I care not whether the bees hang out or whether they are all in the hive, so long as I know that they have sufficient room in the surplus arrangement to store all the nectar that comes from the field; for as they do as well for me under these circumstances as under any other, why should I waste any further time on questions that have no important bearing on our pursuit? Therefore I leave the further discussion of these subjects to you and others, and will turn my attention to things which have more importance, as I consider them.

Borodino, N. Y. G. M. DOOLITTLE.

[The recorded temperature in the hive, contrary to what we might expect, proves very little either way; but I will venture to say that, on a very hot day, the fanners will be harder at work in front of a small entrance than in front of a large one. Say the temperature outside is 110, it takes *energy* to keep the air inside of the hive circulating, and that energy will be proportioned somewhat according to the size of the entrance. Suppose, for instance, instead of having a regulation-sized entrance, it were reduced to a space sufficient to admit one bee at a time. Does it not stand to reason that the fanners would have to work very much harder? Indeed, this small entrance would set up a friction that would result in raising the temperature of the hive beyond a safe point for the combs.

In setting up engines it is always necessary to give a large and free exhaust. If the exhaust-pipe is too small it pinches the exhaust and causes back pressure and friction. If it is large and free, then the exhaust comes as a mere breath. So with a hive of bees. The entrance is the exhaust-pipe; the bees are the engine, or source of energy; and the current of air from the fanners is the exhaust.

With a large entrance, the volume of air can be handled with less fanning and less friction than with a small one; and the very fact that the bees will cluster out more with a half-inch entrance than with one of one or two inches, goes to show to my mind that a hive with an ample opening can be kept cooler, and, consequently, the bees stay inside. When a colony clusters out for several days in succession, I generally expect a swarm.—ED.]

HOW I MANAGE MY APIARY.

An Ideal Railway Apiary.

BY F. E. BROWN.

To start with I will describe the home apiary with its arrangements. We will first go out and see the way the bees are arranged. We find them all in one long double row, about 5 feet apart, and the bees placed upon scaffolds which raise them about 12 inches from the ground. The hives are spaced in the row about 2 ft. apart, and the direction of the row is from north to south, with a row of shade-trees planted just in front of the west row of the double one, thus forming a perfect shade for the bees in the heat of the day, while in the morning till about 10 o'clock they are exposed to the sun. This, I find, is very beneficial in this climate (where we have quite cool nights), as it serves to get the little fellows out to work earlier in the morning; and when the honey is quite plentiful it does me good to see them work hard early and late.

As there are some 200 colonies in this apiary usually, placing them all in two rows makes the ones that are furthest from the honey-house some distance away; and in order to overcome this objection a track is put down between the rows, and a car placed upon it; and as I am now going to commence to extract I will invite the reader to go with me to the apiary. You may have a veil if you wish, but it is not necessary, as the bees are not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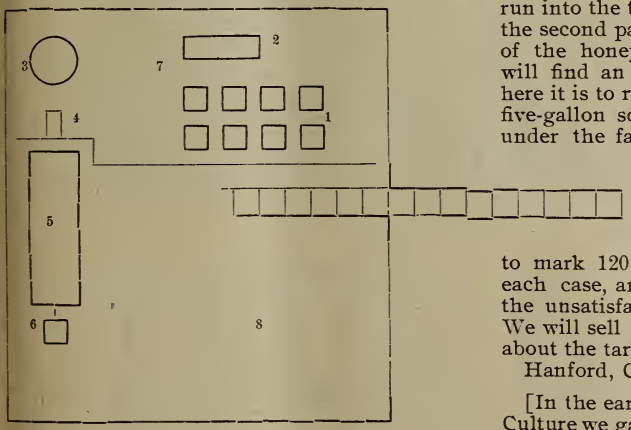
cross; so here — you can take the Crane smoker and I will push the car. You will notice, first, here in this drawer in the end of the car I keep my record-book, smoker-fuel, note paper, pencil, and a tack-hammer, pry, and such things as are always needed on such occasions. I use from six to ten honey-carrying boxes. They are to put the frames in to transfer them from the hives to the extracting-room. I simply take a super and tack a tin bottom on it, as it is just the right length as well as the right depth, and the tin bottom serves to keep all drip from getting scattered and daubed about and wasted.

We will now proceed to the further end of the apiary. It will take me about twenty minutes to take off these eight boxes of honey. I very seldom use a brush, as they shake off very readily.

Now as we have the car loaded we will go to the extracting-room. You will notice that I here have what it would take to make about four wheelbarrow loads; and it is no harder to handle, and much more convenient. Hold on, friend! you don't need to go ahead to open the door, as you will see that it will open of its own accord as the car approaches. It opens to the outside; and as the car passes inside it closes very fast; and as there is no stopping or slacking the speed of the car, the bees that were following up in quest of their goods are quickly cut off. Now I will unload, and place the boxes of honey on this platform that is elevated to the level of the top of the car; then another set of boxes is placed on the car, and the man who takes off the honey is sent back to the apiary while we attend to this load that was just brought in.

Elevated Floor.



If I only had and could operate one of those "cameras" I would illustrate my extracting-room; but as it is I will only try to picture it in your mind, with the aid of this sketch. Fig. 7 shows the elevated floor, while No. 1 is the boxes of honey that have just been unloaded. Between 1 and 2 stands Miss Hoover, the one who wields the uncapping-knife with great speed. Fig. 2 is an uncapping-tank, which is made of wood sides, and ends with a tin bottom; and just above, and resting on the bottom is a frame that is the same size as the inside of the tank, and on the frame is fastened a wire screen, and the caps fall on this screen as fast as they are clipped off. You see they have a chance to drain all the time. At one end of the tank, in the bottom, is an opening that the honey runs out of into an open-top five-gallon can as fast as it drains from the caps. After they are uncapped they are hung by the projections of the top-bars of the frame in one end of the uncapping-tank, as the width corresponds with the length of the frame.

Fig. 3 is a Cowan four-frame extractor. The man who runs this machine stands between it and the uncapping-tank, and can very easily reach the uncapped frames from his position, and pass them in to the extractor, where the honey is extracted, and runs as fast into the strainer, Fig. 4. This is made of wood or metal, a box 14x22 inches, and 10 inches deep. It has two partitions which serve as a separator. The first partition is within 4 inches of the end nearest to the extractor. It is made fast to the bottom, but it lacks 2 inches of coming to the top of the box. The honey falls down into this small compartment, and then it will rise up to the top and run over into the middle room of the strainer. The second partition is placed within 4 inches of the other end of the box, and it will lack one inch of coming down to the bottom. Thus the honey, in coming from the extractor, will plunge down with force into the first part, and it will then rise and bring all the wax with it to the top in order to get over into the second space. The wax and all foreign substances will remain to float on top in this large or middle space, while the honey will be compelled to run into the third or last space through under the second partition, and then up to the level of the honey in the middle space, where it will find an exit into the tank Fig. 5, and here it is to remain until ripe. Then I place a five-gallon square can on the scales, Fig. 6, under the faucet of the tank, and begin to draw the honey; so when the scale will tip at 60 lbs. net I shut down and change the cans. Thus the honey is all weighed, and it will be ready to mark 120 net, which should be put on each case, and then this will do away with the unsatisfactory way of adjusting the tare. We will sell only the honey, and say nothing about the tare.

Hanford, Cal.

[In the earlier editions of our A B C of Bee Culture we gave a view of a "railway apiary," and at that time called attention to the fact that, if the colonies could be arranged in long rows, one on each side of the railway, with the honey house and shop as one terminus and the highway as the other terminus, conditions would be very nearly ideal. I am sorry we have not a photo of Mr. Brown's apiary; but it is substantially like what I have just described.

In our old original home apiary we had a railway running from the honey-house to the

road; and the year that we produced such a large crop of honey, the barrels of extracted were put on the car, run out to the roadway, and rolled from the car on to the wagon. The scheme worked very nicely. There were also times when the extractor was put on the car, and the honey was extracted from the combs almost as soon as they were taken from the hive. Thus many steps, and the carting of many combs to and fro, were saved.—Ed.]

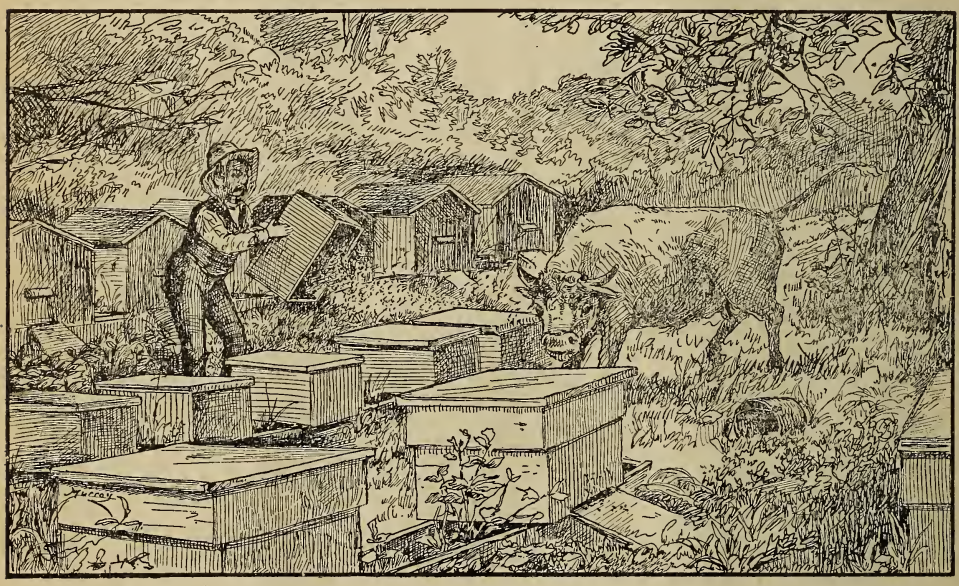
WHICH IS MIGHTIER, THE BEE OR THE BULL?

The Advantage of the "Kick Method" of Taking off Supers.

BY HARRY S. HOWE.

One day recently, Mr. W. L. Coggshall started on one of his regular "bee-expeditions." When he left home he declared his intention of seeing the Varna yard; but the fates willed it otherwise, for on the way he decided to go to the Ellis yard. Here again the hand of fate made itself manifest. Seeing some wintergreen by the side of the road on the way through Ringwood, he stopped to get some, a proceeding to which Dandy, the colt, objected. When La Mar went to get into the buggy, Dandy promptly turned around and tipped the whole outfit over. La Mar, with equal promptness, tipped it back again and proceeded to munch his wintergreen. As a result of the upset, or perhaps in spite of it, he again changed his route, with the result of landing at the Forest Home yard. This yard is situated in an orchard, on one corner of a partially abandoned farm. To get to it he had to ford a large creek, and then go quite a way to where the bees were. The present owner of the farm, which is about one and a half miles from Cornell University, uses it for pasture. All of the fences and buildings have long since gone out of business. When La Mar got to where the buildings used to stand he turned Dandy loose and started for the bee-house. A large bull that was pasturing there also started in the same direction, and then the circus began.

Niver thinks the trouble was all caused by La Mar's reading so much of the Spanish way of doing that he wanted to have a bull-fight of his own. Others incline to the theory that some one had dropped a "yellow journal" in the pasture, and that the bull was the one who was affected by so much war news. Be the cause what it may, the bull soon began to make up faces, and to kick up the grass. Then he raised up his voice and began to utter the most "terrorable" threats. La Mar says that this particular fellow had the loudest voice he ever heard. But then, La Mar is not a good judge of music; and, besides, he was pretty busy thinking how long he might have to stay if he got "treed," and in remembering that he always got nervous when he was up so high.



THE MAN, THE BEES, AND THE BULL.

The "other fellow," about this time, got his feelings up to the point where he could not keep his feet all on the ground at once, and his voice, from its nearness, sounded as though he had got a fog-horn stuck in his throat. Another point that La Mar began to notice rather plainly was that the bull's breath was not particularly sweet, and that his eyes were rather blood-shot. Not wishing to offend his visitor, but still wishing to be alone with his thoughts, La Mar, like the Irishman in the story, tried various hints, none of which the bull seemed to think were intended for him.

Some way he was so intent upon his own troubles that he did not notice that the sticks and stones were intended for him, so the hints were entirely wasted. Just as things were beginning to assume a "blue" appearance before his eyes, La Mar backed in among the bee-hives. The bull, thinking that he had dallied long enough, and that the time for decisive action had come, made a rush for La Mar.

Alas for his plans! La Mar's ruling passion was strong, even in the presence of the bull, and he kicked one of the hives loose from the bottom-board, with one of those never-failing side kicks; then, picking up the hive, he shook the bees full in the bull's face.

On the way home, La Mar was telling of his adventures when he was asked if he was stung.

"I don't remember," he said, "but it is more than likely that I was."

"How did the bull like this reception?"

"He didn't seem to like it very much. The last I saw of him he was off by himself rubbing his nose on the ground, and seeming to feel bad about something."

COGGSHALL'S FAMOUS KICK (DIRECT FROM PHOTOTOGRAPH).

"I don't wonder at that."

La Mar was not satisfied with the fun he had that trip. The next time he went to that yard, what did he do but take along an innocent amateur photographer, who was on the search for interesting subjects to photograph. La Mar showed him a way of getting to the bees from behind, and told him to aim his camera at the front row of hives, and wait for his subject. This he did.

Soon there came a terrific bellowing, a tramping of feet, a shout of "Look out!" and the scene of the previous week was repeated before the astonished eyes of that photographer, who had barely a chance to "press the button" before the bull had again gone to nurse his wrath and a mouthful of bees, in the seclusion of the far corner of the farm.

As for the photographer, he suddenly lost all interest in scenes and scenery. His thoughts were about equally divided between wondering whether the camera would get the bull or the bull the camera, and wondering where those bees would get him next.

West Groton, N. Y.

[See editorials. In addition to what is there said, I will merely state that the chap over in the bushes probably looks a good deal as I did when I saw Mr. Coggshall give his first professional kick.—ED.]

ANSWERS TO SEASONABLE QUESTIONS BY G. M. DOOLITTLE

HOW TO MAKE SUGAR SYRUP FOR FEEDING BEES.

Question.—Please tell us in the October 15th issue of GLEANINGS how to make sugar syrup for feeding bees, as mine are short of stores, and I must feed them for winter, on sugar. Don't refer me to some back number, for I have lent many of my GLEANINGS; and should the number be at home, I do not know just where I may find it.

Answer.—When at a bee convention ten or more years ago I was sitting by the side of Thos. G. Newman, when some one got up and requested that Bro. Doolittle give the convention his ideas on a certain subject on which I had written an article, only a short time before, for both GLEANINGS and the *American Bee Journal*. I turned to Mr. Newman and asked him if I should tell the gentleman that he would find all I knew on the matter in such and such numbers of the *American Bee Journal* and GLEANINGS. His reply was, "No. Give it over to the convention, for it is the 'continual dropping that wears away the rock;' and after people are told over and over again, they will remember what they do not 'catch on to' at first." And this little incident has been forced to my mind "over and over again" during the past two weeks, for there has been no subject which I have given in print so many times as I have my formula for making sugar syrup for feeding bees, and yet scarcely a mail has arrived during the last two weeks but has brought from one to three letters requesting that I tell *privately* how to make "sugar syrup for feeding bees." And so it comes about that I am really glad that some one wants to know about this matter publicly, even if I have to repeat what I have ofen said, for the private correspondence may be lessened a little by a public article on the subject.

This rush of correspondence on the feeding problem is undoubtedly owing to the poorness of the past season in most localities, and I know what it means to have a lot of starving colonies, or nearly so, on hand at the close of the last flowers that yield honey; and I remember with what anxiety I once looked over the bee-papers to find how the bees could be fed on sugar so they would winter as well as though they had plenty of natural stores in the hives. In thus looking over the papers one of them told me that all I had to do was to pour boiling water on sugar, and stir it, when it would be ready to feed as soon as cool enough, so that the bees would not be burned by it. As this was the most simple of all the plans I had ever seen, and required but little work, I thought best to try it. The feeders which I use are known as "division-board" feeders, they being to my liking, as they can be left in the hive when not in use, if I wish, till it is convenient to take them out. As these feeders allow the bees to go inside of them, there would, of course, after they had been once filled, be more or less bees in them when the feed was poured in the second night. It is known by all that, if honey is poured on bees, it does them no more harm than water poured on a duck's back, providing the bees do not drown in the honey; so I could not see any impropriety in turning the feed on them just the same as I would honey.

All went well the first night; but when I came to go to the syrup the next night I found it skimmed over with a thin crust of sugar which had formed on the syrup during the twenty-four hours it had been standing. However, I persisted in feeding it, as the one recommending this way said that syrup thus made needed no cream of tartar or vinegar in it, till one day I noticed bees out at the entrance, of each hive fed, in large numbers, having little grains of sugar on their wings and bodies, where the syrup had crystallized on them. I now looked inside of the hive, when I found that nearly one-fourth of the bees had more or less of these sugar crystals on them, while the inside of the feeders was all covered with them. Upon looking into the cells containing the syrup I found that, in many of them, crystallization had commenced to such an extent that the crystals were easily seen. As I had read of sugar syrup crystallizing solid in the cells I thought it time to call a halt; so when the next batch of syrup was boiled I put vinegar into the water before the sugar was added. This seemed to help much about the crystallization, but it gave a taste to the syrup which it seemed to me would be unpleasant to the bees; so in the next I tried cream of tartar, then tartaric acid; but with any of them the syrup would crystallize some unless I added so much that a disagreeable taste was the result.

While studying on the matter it came to me that, years ago, during some experiments made to prevent honey from granulating, I had used sugar syrup in one of these experiments, which syrup had accomplished the desired end of keeping the honey liquid when cold weather came. I was not long in reasoning that, if sugar syrup would keep honey from granulating, honey must keep sugar syrup from crystallizing. So the next batch of syrup was made as follows:

Fifteen pounds of water was weighed out and put into a tin vessel of suitable size. This was now placed over the fire, and brought to a boil, when thirty pounds of granulated sugar was poured in, stirring all briskly while putting in, so that the sugar would not settle to the bottom, and burn, as such sugar is sometimes liable to do if not stirred in. This stirring is kept up till the sugar is pretty nearly all dissolved, when the whole is left over the fire till it boils again, when it is skimmed, should any scum or impurities arise. It was then taken from the fire, when five pounds of good extracted honey was poured in and stirred for a moment or two, till the whole was thoroughly mixed. This honey proved to be just what was needed, for syrup thus made remained liquid day after day when not fed to the bees immediately; and, even after keeping it several months, by way of experiment, it was found to be as good as ever. Thus I had a feed that is easily made, the whole giving me 50 pounds of feed of about the consistency of honey, none of which has ever crystallized a particle, although I have now used this feed, whenever required, for nearly a quarter of a century.

I trust the readers will pardon me for going over the ground so fully, and I have done so only because some are still claiming that all that is necessary to make a good feed is to pour boiling water on sugar. As I know this to be a fallacy, I thought best to go again over the ground I have traveled, so that no one would be tempted to try the boiling-water plan in making feed, unless such desire to do so by way of experiment.

[While no doubt Mr. Doolittle's plan will make a syrup that will not crystallize, it seems to me there is a simpler plan, and one that can be pursued by the average beginner with less danger of failure. As a general rule, sugar and water, according to our experience, should be mixed in the porportion of one part of water to one of sugar, either by bulk or weight. If, on the other hand, there be used, instead, two parts of sugar to one of water, it will be necessary to do very thorough cooking, run the risk of burning the syrup, and, in addition, use some sort of acid, or honey, to prevent granulation. Our method of making sugar syrup, and one we have used for two seasons with success, is to fill an ordinary honey-extractor about half full of water. Start the reel to going, and then add the sugar gradually until there is enough to equal the bulk of the water. The extractor is turned vigorously until the sugar is all dissolved. For a short time after stirring, it will look as if it were still undissolved, owing to the small air-bubbles. But these bubbles will disappear after the syrup has been allowed to stand for a time. By this plan there is no need of adding acid or honey; no cooking, and, consequently, no danger of burning; and when the bees have ripened or thickened this half-and-

half syrup, they have a better product in the hive, to my notion, than if we were to give them syrup and water of the consistency of ripened honey.

When I visited Dr. Miller recently he did not think it necessary even to dissolve the sugar in the water. He simply poured cold water on the sugar in the feeder. After stirring it a little, perhaps, he lets it stand for the bees to take up. If there is still sugar left in the bottom of the feeder at the next round he pours in more water. The point is right here: If we give the bees *thin* syrup there will be no danger of its granulating or crystallizing in the combs after they have manipulated it, and perhaps put in formic acid. If one does not have an extractor, let him pour the ingredients into a tub, and stir with a stick.—Ed.]

ANOTHER VICTORY FOR THE OLD UNION.

The enemies of the pursuit of bee-keeping have again been defeated. It will be remembered that, about one year ago, Mr. Frank S. Buchheim, of Santa Ana, Cal., was arrested, under Sec. 370 of the Penal Code of California, for keeping 100 colonies of bees on his premises, charging him with keeping a nuisance in the neighborhood, averring that the bees ate up and destroyed the fruit belonging to the neighbors, and interfered with laborers who were engaged in caring for the fruit, etc. His apiary and premises cover 7½ acres. He built a fence 6 feet high to inclose 24 x 32 feet, in which he kept the hives of bees during the fruit-drying season, thus controlling the bees and preventing annoyance to the neighbors. But they were not satisfied with these precautions, and demanded that the bees be moved out of that locality. Suit was brought against Mr. Buchheim for maintaining a public nuisance, and he was fined $50.00 and costs. As he was a poor man with a large family to support, he did not pay the fine, and was committed to jail for 25 days. After 10 days had elapsed, an appeal was taken to the Supreme Court and he was released, pending appeal. In the Superior Court, Judge Ballard ruled on the appeal that the complaint was insufficient to constitute a public offense, and entered a judgment discharging the defendant and exonerating his bail.

The enemies of bee-keeping, not being satisfied with this, instituted another suit against Mr. Buchheim, and, through the efforts of the National Bee-keepers' Union assisting the attorneys for Mr. Buchheim, and paying a portion of the court fees necessary for the defense, they have failed to obtain a verdict against him, though the jury wrestled all night long with the case. At first they stood seven for acquittal and five for conviction, in a community led by a justice of the peace, and organized to persecute Mr. Buchheim, because of his keeping bees successfully and profitably. This is another victory for the National Bee-keepers' Union, and bee-keepers all over the continent will be delighted to learn the facts in the case. Thos. G. Newman.

General Manager N. B. K. U.

San Francisco, Cal.

HONEY-DEW FOR WINTER STORES.

Mr. E. R. Root:—In your editorial on honey dew, on p. 590, you advise bee-keepers to leave it in their hives for winter stores. The professional bee-keeper, having individual ideas on the subject, will read your editorial, assimilate what is useful, but will use his judgment according to locality, nature of the honey-dew, etc. The young bee-keeper, or the man with few stands, however, uses less judgment, or altogether lacks experience, and is very apt to follow to the letter some light in the bee-keeping world, without judgment as applied to the individual case.

In this locality our bees bring in at times, during the summer, a honey-dew derived from insects found on the box-elder. In flavor it has a combination of tastes, none of which I can describe except as having a distinctly sour flavor. In one of my apiaries the bees gather a good deal of this stuff; and, when they have no other honey to use, it has a distinctly injurious effect on many of the colonies, although depending upon it but a few weeks, and in the summer season.

Four or five years ago more than half the bees in this county died. The summer preceding had been poor, and the bees filled up almost entirely on honey-dew. In Preston and a few other localities the bees stored partly with real honey, and came through fairly well. As for my own bees, I extracted from the body of the hives, and when September came they were very light, and were fed up almost entirely on sugar syrup, and I lost only one hive of them.

I bought quite a number of colonies that fall. All of them had honey-dew stores. I prepared them for winter in good condition, placed them in the same cellar with the others, and only one lived. The bees died without any mold or dampness in the hives, except that the honey had fermented, and that caused dampness on the frames containing the honey. The number of such dead colonies examined was about fifty.

Last year honey-dew in this locality had about the appearance and taste of sorghum, and it was gathered from poplars. It fermented quickly; season of yield, June. The trees were free of insects. This year we have had more or less honey-dew all through the season. Some of it is very dark; some is lighter, and very similar in taste to a very good quality of glucose syrup. M. V. Facey.

Preston, Fillmore Co., Minn.

WHY THAT HONEY WAS DARKER.

I give it as my opinion that the separators had nothing to do with the color of Mr. Golden's darker honey, unless, possibly, in this hive they were tin instead of wood, which

might have made more travel-stain. It could easily have been caused by darker combs in brood-chamber. Take very white honey, and press cappings down until they touch the honey, and it will have the darker appearance of that made by colonies which fill their cells too full of equally white nectar. Every once in a while I get a super that has to go one grade lower because the cappings are tight against the honey. G. K. HUBBARD.

Riverside, Cal., Sept. 26.

THE BEST WAY TO UNITE WEAK COLONIES FOR WINTER.

A GOOD way to double up weak colonies in the fall is to unite them with stocks brought from the out-yard. It often does little or no good to unite nuclei both from the same yard; but results are very different when the two lots of bees come from *separate* yards, for then there is no going back of one lot of bees to their old homes. We are about to practice this plan at our home apiary when we bring in the out bees.

THE NAUGHTY JUTTY CORNERS IN THE ORDINARY ONE-PIECE SECTION.

BYRON WALKER, when visiting us, drew my attention to the fact that the ordinary old-style scored-out one-piece sections filled with honey are much more liable to gouge into the face of the combs in ordinary handling, such as, for instance, putting in and removing from the shipping-case, than the ordinary four-piece section. The latter has no jutty corner—nothing but the widened ends. Mr. Walker says he greatly prefers the one-piece section with its openings at top and bottom reaching clear out to the sides, the same as in the four-piece box.

A correspondent just calls my attention to the fact that the plain section is better than either of the two above mentioned, for there are no corners or edges that project beyond the other parts of the box. For that reason the section can be slid in and out of the shipping-cases and hive supers without marring the face of the comb.

HIVES SHORT OF STORES FOR WINTER.

THERE is every reason to believe that, owing to the poor honey crop this year, there will be a scarcity of stores in the hives for winter. Many bee-keepers, whenever a failure of honey occurs, will philosophize something after this fashion: "Them bees didn't get me no honey this year. If they can not pay for theirselves, I guess I'll let 'em go Gallagher." And they do. Another class, also forgetting the big crop of last season, and being too busy with their other work on the farm, will just simply neglect the bees. It did no harm to let them go last season, because there was plenty of honey in the hives; so in a half-hearted way they "guess" there is enough in them this fall. At all events, they are too busy; and if the bees die — well, perhaps they will buy more next season.

The careful, provident bee-keeper knows perfectly well that it is very unwise to let bees shift for themselves at any time; and there is scarcely one who looks back over the past who will begrudge sugar fed that the bees did not earn that season, but perhaps may earn next year or some time in the future.

Editor Holtermann, of the *Canadian Bee Journal*, sounds a similar note of warning, and I am sure it is needed.

A GOOD HONEY YEAR IN CANADA, AND A POOR ONE IN THE UNITED STATES; WHY THIS DIFFERENCE?

MR. R. F. HOLTERMANN, who made us a short visit on the 7th inst., reports that the bee-keepers of Canada have had a most excellent season. The year throughout the United States, excepting Colorado, Florida, Vermont, Michigan, and Northern California, has been a most signal failure. Now, why should Canada, so near us, have a good honey-flow, when we here in the United States have had almost the opposite? I remember last summer, when clover ought to begin to yield, we had been having quite a spell of dry weather. Day after day went by, but no rain. Finally when it did come, and copiously too, we hoped, but hoped in vain, that the long-expected nectar would come. While these copious rains seemed to be general over the United States, and while they came in time to stimulate general farm crops, it was evident they were *too late* to have any decided effect on the honey crop of the United States—too late, perhaps, by two weeks. Now, why did the bee-keepers of Canada enjoy a good season? This strikes me as a possible explanation: The honey-flows in Canada are anywhere from ten days to two weeks later than in the United States. Assuming that our friends who are north of the line enjoyed those same rains that we did, and at the *same time*, then those same rains came just in time to stimulate nectar secretion in the blossom, but just too late for the United States.

BYRON WALKER, AND HIS TEN APIARIES IN NORTHERN MICHIGAN.

FOLLOWING closely upon the visit of Editor Holtermann, Mr. Byron Walker, of Evart, Mich., stopped off at Medina *en route* for Pittsburg, whither he was going to buy or sell honey. Mr. Walker is not only an extensive producer, but a large buyer of both comb and extracted. During the summer he runs a series of out-yards, and at the present time he has something like ten apiaries. He has known scarcely a failure of honey in all his years of experience. And why? Because he has a good locality near the regions of the willow-herb, and because he is an intelligent and progressive hustler. Indeed, I'm almost afraid he is working himself to death.

After he has harvested his crops, and pre-

pared the bees in his several yards for winter, he makes his headquarters in Chicago, where he markets his honey. When that is all sold he makes a general business of buying and selling. Said I, "Mr. Walker, you come as near being a specialist bee-keeper as any man we have in our ranks."

"I guess that is true," he replied.

It is too bad that Mr. Walker is so busy a man—so busy, in fact, that he scarcely finds time to eat and sleep, much less to write for bee-papers; but very fortunately, W. Z. Hutchinson has already paid him a visit, and has begun to tell in the *Review* something about this rusher of a bee-keeper, who always gets a honey crop. Said Mr. Walker, as he boarded the train, "Now don't go and write me up." I didn't exactly promise; and while I haven't told some things, also to his credit, I couldn't forbear saying what I have said above.

THE A. I. ROOT CO.'S EXHIBIT IN THE APICULTURAL BUILDING OF THE OMAHA EXPOSITION.

ELSEWHERE in this issue will be found an illustration of our exhibit as it appeared in the Apicultural Building at Omaha. It stands very near the center of the building, and surmounting the whole is a large sign made after the pattern of our trademark. Within the inclosure are represented samples of nearly every thing we make in the line of apicultural supplies. At the left, and hanging to one of the posts, is a handsome water-color picture showing our factory and the general manufacturing plant. Just behind the post, in the foreground, stands one of our four-frame ball-bearing Cowan extractors. This is the third ball-bearing extractor we ever made; and the results are so satisfactory from the ease of running that we have decided to make our 1899 machines ball-bearing—that is, the main bearing that supports the reel. From some careful tests we have made, putting two machines of the same capacity and style side by side, and giving the handle of each machine an equal impetus, we found that the machine with the ball bearings would give just about twice as many turns when left to expend its force as the same machine, identically, without the ball bearings.

Close to the post on the right is a No. 15 two-frame Cowan and Dadant uncapping-can. The center of the exhibit is made up of various styles of hives, perforated zinc, smokers, solar wax-extractors, foundation, swarm-catchers, and a dozen and one other things that we make, too numerous to mention. Our thanks are due to Messrs. Whitcomb and Stilson for the very neat and tasty arrangement of the exhibit. When A. I. R. and myself came into the building we felt proud of our exhibit.

GLOVES IN A BEE-YARD.

WHILE visiting at Dr. Miller's I had several little chats with "Em," his sister and helper in the bee-yard. In one of these interviews I mentioned incidentally the great amount of propolis I found in their hives; and then she explained that she always wore gloves, partly because she could work faster, partly because she didn't like the stings, but mostly because she could not stand the nasty, sticky stuff (propolis) on her fingers. She finally brought out her gloves with their long sleeves. These gloves were made of hogskin — "horrible-smelling things," she said, when new; but after they had been used for a time they lost their porcine odor. On the greaves of the gloves are sewn long sleeves, the opposite ends of which, when put on, are fastened to the shoulders.

"Why," said I, "how can you pick up queens?"

"I don't do it," said she. "I call Dr. Miller after I find the queen. He comes, picks her off the frame, clips her wings, and puts her into the hive again."

"But, aren't those gloves awkward?"

"Not when one gets used to them. Why, I don't care how cross the bees are; I can work right along just the same."

"But, aren't the gloves filled full of stings?"

"Why, yes, I suppose they are." Then she produced her old pair for my inspection, but I did not see the evidence of many stings. "But," she continued, "I would rather have stings in my gloves than in my fingers."

I told her I had half a notion to try the same sort of gloves when I got home, just to see if it were awkward to handle frames with them.

I have always had a sort of pity for timid ones who find it necessary to wear gloves among the bees; but fear of stings, I am now convinced, is not the only reason why they are used, unless it is in the case of the Coggshalls. I would pity the man who did *not* wear them in *their* yards as they work them, especially when La Mar Coggshall gives a hive one of those famous kicks of his as illustrated in another column.

COGGSHALL AND HIS FAMOUS KICK-OFF-SUPER ACT.

A YEAR or so ago I told you something about how Mr. W. L. Coggshall saves time by kicking his hive-supers and hive-bodies off the brood-nest. At two or three of the conventions where I have told of this acrobatic feat, there have been quite a number of questions asked. One man incredulously asked, "Why, do you mean he actually kicks the hive-body off from the brood-nest?" He seemed to think that I was either stretching the truth or that I meant Mr. Coggshall did it metaphorically. Well, to show that he literally and truly does that thing, I take pleasure in presenting an engraving in another column.

You have all heard about "kickers;" but here is a man who has done another kind of kicking—kicked off more hive-supers, I will venture to say, than any man living; and he does it in such away as not to rack the hive-body nor to make the bees more than stinging cross. But what cares he if it *does* stir the bees up a little? Any man who would dare to throw a whole hive of live mad bees upon a charging bull would not be afraid to take a few stings himself. The drawing elsewhere, showing Coggshall, the bees, and the bull, is

also taken from an instantaneous photo. Unfortunately the kodaker was so badly scared that he did not get a very steady picture—at least, not clear enough to answer for a half-tone reproduction; but he succeeded in procuring a picture from which our artist could make a pen-drawing. I told him to follow the picture faithfully, even giving the gleam of the eyes of the about-to-be vanquished bovine. I have seen that same gleam myself, and know how it feels to have the hot breath and a pair of wicked eyes almost, as it were, in one's face. Yes, I have been there exactly, but I did not have the bees to help me do the vanquishing.

LOCALITY, AND ITS BEARING ON PROPOLIS; HOFFMAN FRAMES INTOLERABLE AT DR. MILLER'S.

In my travels over the United States I have paid more or less attention to the matter of propolis and how its character varies in different localities. In one place it will have a reddish transparent color; in another, a sort of grayish muddy-brown, something like coffee with milk in it; but instead of being brittle it has more or less of a gummy, sticky consistency. Again, the quantity of either the red or brown article may vary considerably. At Dr. Miller's, when I visited him some two weeks ago, I noticed how propolis seemed to be daubed over every thing. It was of a brownish color, and was so sticky, indeed, that it would get daubed all over one's fingers like so much half-cooked taffy. At Medina we have a propolis of about the same consistency, but I should say there is less than half as much of it. Here I can usually separate Hoffman frames with my fingers; but at Dr. Miller's the same operation would be almost out of the question. Indeed, I noticed the doctor had to pry as hard on his nail-spaced frames as we on our Hoffmans.

The doctor has long insisted that Hoffman frames would not be suitable for his locality, and I have always wondered *why;* but I understand it all now.

In any locality where propolis is freely smeared over every thing as it is at Dr. Miller's, any thing in the nature of a self-spacing frame having wood parts coming in contact would be simply intolerable; but in the State of New York, not only Hoffman frames, but frames with end-bars closed all the way down, are perfectly practicable and feasible. There propolis is scantily used, and what there is has a transparent reddish cast, inclined to brittleness rather than to gumminess. In Ohio we have about the same quantity, but different in color.

In any locality, so far as I know, propolis is inclined to be more sticky during the months of September and October than at any other time of the year; but that stickiness for the same time is considerably worse at Dr. Miller's than here at Medina. Why, when I pulled one of the doctor's hive-covers off, the propolis would stick to it in strings six or eight inches long. Indeed, these strings reminded me of miniature water-spouts, one end sticking to the frames and one to the cover.

Well, now, what is the practical conclusion about this whole matter? Simply this: That in a locality like Dr. Miller's a nail-spaced or a staple-spaced frame, or any frame with metal projections or distance-keepers, would be preferable to one having wood coming in contact. Indeed, I am not sure but the metal-spaced frames would be preferred in any locality.

I have been at Dr. Miller's several times before, but I had never noticed particularly the amount of propolis on his frames—the waxy, sticky kind that would almost make one feel ugly, even if he did not say any thing naughty.

Here is the advantage of traveling around and comparing localities; and the editor of a bee-paper is just the man, out of all the fraternity, who should go enough among bee-keepers to broaden his mind to a point where he can see reasons *why* one holds to one opinion and another to an opinion almost the opposite. For instance, one bee-keeper thinks the Hoffman frame an intolerable nuisance, and another regards it as the *ne plus ultra* of perfection.

OMAHA CONVENTION NOTES.

At the Omaha convention various practical questions were propounded and answered by the members present. Among others was the question,

WHAT IS THE FOOD VALUE OF HONEY?

Dr. Miller facetiously threw in the reply, "Fifteen cents a pound."

Mr. Whitcomb, of a more serious turn of mind, thought we often underrated the value of honey as food and medicine. In his opinion there was more nutriment in a pound of honey than in two pounds of pork, and more medicine than in fifty cents' worth of drugs In his institute work he took pains to emphasize the value of honey as a food, and said it should be on the table as an every-day diet. Others concurred in this, and made the suggestion that Dr. Miller's honey-leaflet, "Food Value of Honey," should be thoroughly distributed among consumers. Dr. Mason stated that his family used a large amount of honey; that, during a siege of the grip, those who ate liberally of this best of all sweets escaped the full effects of the malady, and those who did not were stricken down; and then he asked the question, "How much longer should we live if we used honey in our coffee instead of sugar?"

Another question was asked:

IS EXTRACTED HONEY MORE HEALTHFUL THAN COMB HONEY?

Dr. Miller believed that the average sample of comb was better than the average sample of extracted. As to the wax in the former, that was surely indigestible. We might swallow it, and it probably would do us no great harm, nor would it do us any good. The best extracted was surely better than the average of comb. Still another question was this:

IS IT BETTER TO USE WHITE OR CREAM-COLORED SECTIONS?

This called forth a lively discussion. While a few talked for cream-colored on the ground of economy, the majority preferred to pay

more and get the very best. This preference seemed to be based not so much on the fact that cream-colored goods *looked* inferior, but on the supposition that the wood was less tough, and hence more liable to break at the folds. Several dealers testified to having sold cream-colored sections since they could get no other in the rush of last season. This experiment they would not try to undertake again, as their customers entered a "vigorous kick."

Attention was drawn to the fact that cream-colored sections were not necessarily inferior, in point of toughness or strength of wood, to the ordinary white basswood. The wood might be cream-colored because of inferior timber, and it might be cream-colored because it might be summer instead of winter cut. In either case one timber would be as tough as the other—the only difference being in the color. Basswood, to be white, should be cut in the winter, and piled during freezing weather; otherwise it was liable to stain.

As to whether the ordinary white honey showed off any better in cream-colored sections, there was a diversity of opinion. Some thought the honey looked whiter; others, including Dr. Miller, could not see that it made any difference.

CUBAN HONEY, AND ITS EFFECT ON AMERICAN MARKETS.

A very interesting paper from O. O. Poppleton, on Cuba as a country for bees, was read at the Omaha convention. He kept bees on that island a few years ago, but at present was in Florida. He spoke of the fact that apiculture in Cuba was now in a crude state, but there were opportunities for a wonderful development of the business. Indeed, he thought it might outrank California. He went so far as to say that Cuban honey could be produced for two cents a pound.

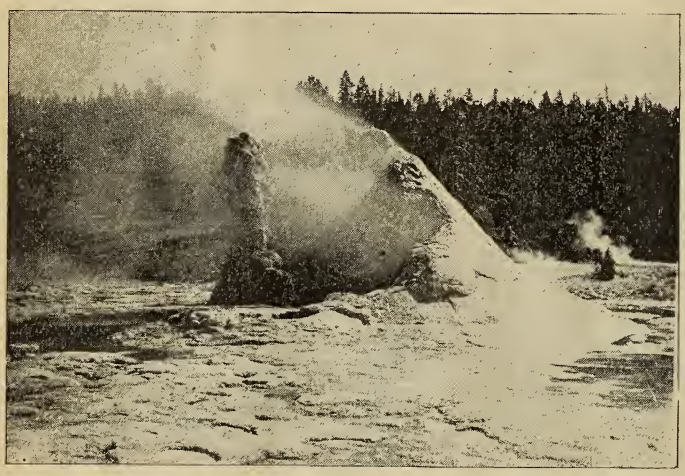
In the discussion following, the general consensus of opinion seemed to be that nearly all the honey coming from Cuba had an insipid or inferior flavor; and that, while it might compete in the market with some honeys produced in the southern part of the United States, it could not have much effect on the honeys of the northern portion. The point was made that the honey taste or honey standard of a locality is gauged largely by the kind produced in that locality. For instance, in certain parts of York State buckwheat honey is preferred to white by many. In Cuba the "bellflower" would have the preference, and that, indeed, was pronounced to be a honey of very fine flavor, but not of such a flavor as would tickle the palates of those who have been used to the peculiar taste of Northern basswood and clover. It was further shown that Cuban honey had been generally quoted as so much a gallon, and that in many places in the United States it had sometimes gone begging; that it was fit only for the use of bakers, who prefer it to honeys of a lighter color and milder flavor. Indeed, some one said the bakers preferred the rank dark honeys because the milder flavors would entirely disappear in the baked goods, while the strong-tasting article would make a honey-jumble or cooky of a distinct honey taste.

YELLOWSTONE PARK, CONTINUED.

One of the pleasant features of Yellowstone Park is the number of tourists one meets every little while. Some of them travel in very rude and commonplace vehicles. For instance, we saw one outfit that consisted of a little cabin made of rough pine boards mounted on a rude cart drawn by one horse. A stovepipe stuck out of the roof of the cabin. Inside there was an arrangement for sleeping, cooking, dining, etc. A good many go in families, or a crowd of several, with ordinary canvas - top - covered wagons. The regular transportation companies have, as a rule, very nice coaches. I remember passing several times what they called the Chadburn Company. These are, perhaps, the handsomest coaches seen in the park. A wagon follows after them, carrying the tents, etc., which are set up at every stopping-place. The coaches look very well, it is true; but the glimpses we had of their hasty camping-places showed that they were any thing but attractive compared with the Wylie camps. You see, every thing has to be torn to pieces and loaded up every day, and they are not as pleasant or tidy as the permanent camps. The Chadburn rigs, however, are very cheap. They make the round trip in about five and a half days, and charge $25, every thing furnished.

A good many go on horseback. Several times I noticed a young lady (with a party of nice people) riding a very pretty pony. Her pony was so well trained, and so obedient, she would alight whenever she wanted to examine any thing more thoroughly, and he would stand until she came back or called him. She was very tastily attired in a neat riding habit. Not only was her pony a beauty, but the young woman herself made one forget the springs and geysers sometimes. When near the Black Growler she left her pony at a little distance, and made her investigations at about the same time I made mine. "Jim" was pricking up his ears at the sight of the escaping steam, and he seemed a little alarmed at the terrific uproar. When his mistress had finished her investigations she beckoned him to come on, as she was ready to ride. Just at this point I was more interested in seeing whether Jim would march right straight up to his mistress, so close to the hissing steam, than I was in the geysers. He went up a little way, then stopped, and by his actions he showed he would like to be excused from going any nearer. At this she spoke a little peremptorily: "Come right along, Jim. It won't hurt you a particle. Don't you see *I* am here? *Come*, I say." To my great surprise, the handsome, obedient, and intelligent animal obeyed her command, and came right up, even though he trembled with fear. He had been so well trained, and evidently had such confidence in, and love

for, his handsome young mistress that he yielded to the motion of her hand and to the entreaties of her voice when perhaps a strong man could not have pulled him up by force. If any of our party should happen to read this, they will know why the stage had to wait so long for me to investigate (?) more critically the Black Growler and Hurricane. I can not quite recall all the wonderful things I saw on that eventful afternoon. Toward evening the coach crossed the bridge over Firehole River, passing by Morning-glory Spring, Fan Geyser and Mortar Geyser, stopping a little right at the bridge to let us catch a brief glimpse of Riverside Geyser, that throws a stream of water so it falls directly into the river. Then we went around to the Wylie permanent camp right close to Splendid Geyser. At this camp we passed all day Saturday as well as Sunday; but I have already told you about the meeting Sabbath evening. Early in the morning we visited Riverside Geyser and saw it play repeatedly, for it



CONE OF THE GIANT GEYSER.

"goes off" about three times a day. This is really one of the prettiest in the basin, in my opinion. Shortly before it has an eruption, a little fellow a few yards away sends up a slender stream of steam and water, with quite a comical mimic of the great geysers. The eruptions commence gradually, increasing till they get up to 100 feet. There are some seats placed on the opposite side of the river, where you can usually find more or less spectators when the eruption is in the daytime.

As an illustration of the wonderful crystal clearness of the water, when several of our party were over there just at dusk, after an eruption, I proposed jumping down into a cavity near the crater, to examine it more thoroughly. One of the ladies cautioned me, saying she did not think the water was all out. "Oh! yes, it is," said I. "See." Then I tossed in a pebble to make sure it was empty. To my great surprise and considerable fright it splashed in the boiling water that filled the basin. Had I stepped in as I proposed, I should have been scalded severely.

There are twenty-five or thirty geysers all together, mostly in this Upper Geyser Basin. By the way, you want to be sure to say *geyser*, giving the letters *ey* the sound of *I*. If you do not, the guides and drivers will be sure to catch you up.

Now I can not describe all of these wonderful springs and geysers; but I will go over them very briefly. "Grotto" has a great number of craters, and during an eruption the water and steam make a terrible commotion as they puff and spurt out of the various openings. "Giant" is, as its name indicates, one of the principal ones in the lot; but as it goes off only once in from two to four days, we did not see it. To tell the truth, it played in the night after we arrived. But I did not hear it, as I was so tired from the amount of travel I did the day before. Below is a picture of the mouth of the giant.

On one side the crater is broken away as you see. This was probably done by some tremendous eruption. There is an accumulation or deposit around it for forty or fifty feet. The water is sometimes lifted in a column 250 high, and the rumbling has been likened to that of a train of moving cars. The play lasts from one and a half to two hours. The cone you see in the picture is about ten feet high.

There is a new geyser called Daisy. This is near by the Comet, and was so close to our camp that a number of our party saw it several times, for it goes off about once every other hour.

One of the prettiest things in the whole geyser basin is what is called the Punch-bowl. It is not a geyser, but a beautiful hot spring. On the next page is a picture of it.

Now, these scalloped walls that hold the pool of water remind me more of beautiful Etruscan jewelry, interspersed with the choicest and rarest gems, than any thing else. The outside edge is beautifully decorated; but when you come to look over into the water, with its sparkling clearness, you think it must be a brilliant illusion borrowed from scenes in the Arabian Nights. The most beautiful part of it is on the opposite side of the wagon-road that runs near. But our party had seen so many sights I absolutely could not get them to alight from the coach and walk around the Punch-bowl. The edge of the basin is about five feet above the level of the ground. The whole structure is kept bright with its startling brilliancy by the boiling water that constantly flows over and

washes and cleanses the whole of it. The escaping steam and gas produce waves like ripples that make it a thing of life instead of a piece of dead jewelry. In the foreground you will notice a little pool. I think this has been called the Angels' Coffin, or something that sounds like that; and, in fact, it has the

DEVIL'S PUNCH-BOWL.

appearance of being lined with the richest and rarest satin that the world has ever produced. All I have ever seen in the way of silks and bright ribbons can hardly compare with it.

A little further away from our camping-place is Beauty Spring, Grand Turban Geyser, Sawmill, and Spasmodic. Sawmill Geyser looked like a saw, or at least some imagined it did, and it makes a hissing noise, something like a buzz saw cutting a log. As it goes off every thirty minutes you can hear it, and then see it, every little while. Spasmodic goes off about every twenty minutes, and throws water about forty feet high. The Lioness and Cubs are close together. While the mother erupts only about once a day, the cubs are spouting water ten or fifteen feet high every little while; and when you see the three playing together it makes a very pretty sight.

Now, there is one beautiful spring not far from here, the name of which I have forgotten. Its wonderful peculiarity is that it is constantly sending up bubbles of gas or steam that have a brilliant blue color. As you catch a view of this weird tint away down in the depths of the pool, and watch till it reaches the surface, it seems like a phantom light. I went over and sat down all alone, and tried to investigate and see what it was that caused this blue sulphurous dancing flame, as it seemed to be, away down in the depths of the water. I could not make it out. When the bubble had reached the surface it was gone. Biscuit Basin is somewhere in this vicinity. It is in connection with Sapphire Pool. We give a picture below. These little projections above the water look for all the world like veritable biscuits, but many of them were rather more fantastically ornamented than we find them on the dining-table. Although they looked soft, and almost fit to eat, you can walk over them without injuring the delicate surface; and if your foot should soil them, the boiling water will soon wash them off clean. This Sapphire Pool is a pulsating spring; and it is the rising and falling of the water that has produced the biscuits. You can not get a good view of Sapphire Pool without walking carefully over these stepping-stones.

BISCUIT BASIN AND SAPPHIRE POOL.

Castle Geyser attracts very much attention. There are seats all around this one, where visitors can sit and wait for the display. You will almost always find a crowd hanging around it, because it has a rather tantalizing fashion of making strangers think it is going

to erupt. It will often start up and throw the water thirty feet high, when it has no notion of going up the whole hundred feet at all. It has the largest cone of any in the whole region. You can easily walk up to the summit; and the tinted and colored pools of boiling water that you meet all the way amply pay for the time and pains. It goes off at intervals of from eight to thirty hours. Sometimes it makes believe five or six hours before it goes off. When it does erupt, it often runs short of material, so far as water is concerned, and then it spouts out steam until it makes night hideous with the sound. There are some of the most brilliant pools close by Castle Geyser. One of them is called Castle Well.

Perhaps it would be well to wind up with Old Faithful, so called because it has never, in the memory of man, disappointed a customer. You can go and hang around Castle, Giant, and ever so many others, thinking they are going off very soon, until you get tired of waiting. But Old Faithful is as regular as our best-appointed railways. Every 63 minutes, day and night, winter and summer, the exhibition is sure to "come off." People may stand and hold their watches, and tell you when the first act in the drama will begin. Small spurts begin five or ten minutes ahead of time to let everbody know what is coming. The guide-books say, "a column of hot water two feet in diameter" is thrown from 125 to 150 feet, straight up. I should say the distance is all right, but it did not seem to me that the stream was so large. The crater is on the summit of a littte hill about twelve feet above the level of the ground. The ground slopes off gradually with the usual pools of water, clear as crystal.

Let me give you an idea of the amount of water that is thrown out by some of these springs. Chittenden's book on Yellowstone Park says than an average eruption of Old Faithful throws out more than a million gallons of water; and such a quantity of water every hour would be enough to supply a city of 300,000 inhabitants. Now, then, think of the combinations of heat and water exactly united so as to keep this wonderful display going on, day and night, winter and summer, for not only a thousand years, but perhaps for many thousands. Well may we exclaim with the Psalmist, "O Lord, how wonderful are thy works! in wisdom hast thou made them all."

If it be possible, as much as lieth in you, live peaceably with all men.—Rom. 12: 18.

When I was on my way to Yellowstone Park I stopped over during the day in Chicago. I mentioned trying to rent a wheel in the morning, and what the policeman said. Well, I did not find one to suit me until I called at the office of the *American Bee Journal;* and the editor then kindly placed his wheel, almost a brand-new one, at my service. After giving me some directions, the wheel and I started off together. Just as my foot struck the pedal, however, I discovered the crank was bent. I got off, and was going to ask Mr. York about it, but he had turned the corner. I called at the first repair-shop, and asked them to straighten the crank; but they explained that the material was of such fine steel, and of such very high temper it would be quite sure to break; and when told it was a borrowed wheel they said I had better not do any thing with it.

I started out for Lincoln Park, but at first I thought I could not possibly get along with a wheel in that condition. At every half-turn of the crank I was obliged to shift my heel, first one way and then the other. I thought of going back to tell friend York that I could not ride it in that way. Then I thought of going to another repair-shop. But I finally decided not to take liberties with a borrowed article, and concluded I would go out to Lincoln Park and back in some way, anyhow.

It was not very long before I found out that my heel was learning the crook so it did it with very much less trouble. A little later I rode quite comfortably, and before noon my ankle grew so familiar with the rocking of the crooked crank that it accommodated itself to the unusual twisting motion without shifting the heel at all. After dinner I rode just as well, or very nearly so, as with a crank perfectly straight. This illustrates the wonderful way in which these bodies of ours adapt themselves, and very quickly too, to unusual demands, or new circumstances and conditions. I have read in some scientific work that this wonderful thing which wheelers call "second wind" comes about largely because, after a certain set of nerves and muscles has been required to do a certain work over and over hundreds and thousands of times, they get so they work in a sort of automatic way. They go through the motions as a matter of course, without any exercise of the will, and comparatively little weariness of muscle. Of course, outdoor air, and a large amount of oxygen, have much to do with it.

In the afternoon I took a ride on the same wheel down Jackson Boulevard, going many miles, and without a thought of a crooked crank. Friend York explained to me, after I got home, that he had forgotten to mention the matter, and tell me that, if I would keep right on, in a little while I would not notice it. Now, I wonder if that is a trick our good editor has of keeping a wheel that nobody would want to borrow. I am sure, though, he was very glad indeed to accommodate me in the way he did. The reason I did not use my own wheel in Chicago was because it was packed in a wheel-trunk, and checked clear through to Cinnabar, Montana. On arriving at the latter place I unpacked my wheel, put my extra clothing, etc., back in the trunk, and started to explore the wonders of the park. Now, a very singular thing occurred right here. I got on to my wheel to see that it was all right, with proper adjustment, etc.; but

before I had gone a rod I said, "Well, I declare! my wheel has got injured in transit, after all. And how strange it has happened! that very same crank is bent that was bent on Mr. York's wheel."

I got off and looked the crooked crank all over, and it seemed all right. I spun it around with my foot. Every thing was perfectly free, perfectly solid and true. I got on again, but there it was. My foot wanted to rock back and forth at every revolution of the crank, just as it had been doing in Chicago. Do you guess at the truth, dear reader? Well, I did about that time, and began to have a big laugh. In just one day's riding my ankle had become so adapted to its unusual conditions that the stupid thing would not work right when I had a crank that was *not* bent; and I had to go through the same experience in teaching my left ankle to adapt itself to a *crooked* crank. It did not take so long, however. But the next morning the ankle commenced again to make a feeble protest, and to demand a crooked crank.

Now, there is a great moral lesson here. God has, in his infinite love and wisdom, made these bodies of ours so flexible, if that is the proper word, that they can put up with or adapt themselves to an infinite variety of circumstances and suggestions. Some months ago I wrote you about a second self or another fellow that exists in my make-up, and who seems to be taking care of the welfare of my physical being. This fellow gets turned around, as I told you, and almost declares at times that the sun rises in the west and sets in the east. Now, I had a glimpse of this contrary chap right here. He kept insisting that a crooked crank is better than a straight one, simply because he had, with much trouble and pains, adapted himself to the former.

Well, I have had a long talk (have I not?) about something which, even though it be interesting and peculiar, has no particular bearing on our text. But are you *sure* it has no bearing? Does it not just begin to occur to you that, if these bodies of ours are capable of such adaptability, we should gather from it moral and spiritual lessons? While I have been telling this story, doubtless more than one of you have remembered similar experiences. When a boy first tastes of tobacco his whole physical frame rebels—yes, and continues to rebel; but if the boy gets it into his head that it is going to make him manly, and if he persists in forcing the unnatural poison into his system, this wonderful economy of ours makes arrangements to get along and endure the poison. Getting inoculated so as to enjoy comparative immunity from the poisonous effects of bee-stings is along in the same line. Nature does at first protest, then does the best she can under the circumstances; then she quiets down and gets along in tolerable comfort, and without being very much disturbed by the poison. Perhaps it might be well to suggest here, however, that dear, kind, patient, and oftentimes long-suffering, old Dame Nature does finally, at least sometimes, give way, finding herself unable to stand the strain. The result is tobacco ulcers, and, with strong drink, delirium tremens; and some of our veteran bee-keepers declare that, after one has been stung an *unusual* number of times, month after month and year after year, serious derangements begin to follow.*

Just now, however, we can not stop to follow through all this line of thought. I told you how I got along with the crooked crank. Some of us have had a like experience in getting along with crooked or cranky neighbors. Where they are both cranky and crooked, it is sometimes pretty hard to follow out the teachings of our text. But, dear brother and sister, I want to assure you that there are great and unexplored regions in this direction. I myself am not naturally constituted so as to get along with contrary people. I have said hundreds of times, "I declare, I will not put up with this thing any longer;" but when I have considered the matter a little more, or, better still, when I have come to *pray* over it, oh how many times I have decided as I did with the crank to that wheel! and as I have made my decision I have said to myself, "Lord, help me to get along with this unreasonable neighbor of mine. Help me to choose the best and wisest way under the circumstances, and help me to bear with him for his own sake and for the sake of his wife and children. Help me to put down self, and to live peaceably with him for *Christ's sake*." And how glad I am that I have put up with the peculiar characteristics—nay, more than that, with the unlovely traits of those I sometimes meet.

Years ago I became acquainted with a man who had some peculiar things about him that were very vexing. He had had bad luck in getting a place, and worse still in keeping it. Sooner or later almost everybody who worked near or with him became tired of his ways. I remember distinctly that one of his own countrymen declared he would not work with him at all. This was very annoying under the circumstances, but we finally concluded to keep the two men away from each other, even though it was very desirable at times to put them together to do certain work. This man tried me so exceedingly that I several times declared I could *not* be bothered with him any more. Finally his wife came to me pleading. She said, in substance, "Mr. Root, I can not deny what you say; but suppose you were in *my* place—suppose you were obliged to put up with this very thing every day of your life, as I am. You certainly can not advise *me* to give him up, as *you* have decided to do, for you know the large family of children that are about us." She was a Christian woman; and as she closed her remarks she

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*I clip the following from a recent issue of the *American Cultivator:*

According to the results of an inquiry among the bee-keepers of Germany, human beings may acquire immunity from the effects of bee-stings simply by being stung a sufficient number of times. In some cases thirty stings sufficed to impart the desired immunity; in other cases as many as one hundred stings must be endured before the victim ceases to suffer serious inconvenience from the attack of bees. Occasionally a person is found who is naturally immune to the effect of bee-stings, while others are not able to acquire immunity by any amount of heroic experience.

uttered a little prayer that I knew came from her heart. The prayer was very much like the one I have breathed so often—"Lord, help me in my extremity." Do you wonder I looked at the matter in a different light? I, too, prayed for grace. I studied this man and talked with him, and finally decided that his peculiar ways were not altogether from deliberate stubbornness. I began to discover he had a fashion of going ahead with his work without asking questions enough to be sure that he knew what was wanted. Years have passed. I rejoice now that I can call him one of my particular friends. He has become acquainted with me, and I with him. He is cranky, and I do not know but *I* am cranky; but I believe the grace of God has helped us both to manage so that our respective crooked cranks do not come in collision. Well, my experience with him has helped me to get along with *other* people. Day after day I am beginning to find out that, if we are patient, and keep our tempers down, we can get along pleasantly with many things that seem at first sight as out of the question.

Once more: The things we often think at first will not answer at all sometimes prove to be blessings in disguise. The crooked crank, when we become accustomed to it, helps us to get through many troublesome places where the straight one we thought we *must* have wouldn't answer. What a blessed work it is to try to make the *best* of every thing for Christ's sake!

For a few months I have had considerable to do with railroad men and railroad corporations. On my way to Omaha, the baggage-master of the Northwestern R .R. said I would have to pay extra for my wheel, even though it was packed in a trunk with my other clothing, etc. I told him he was wrong, but he produced his documents to show that wheels and baby-carriages would have to go at owner's risk, and there was nothing said about wheels being packed up in trunks being an exception. I told him the wheel had gone thousands of miles over that very road, packed in that trunk, as personal baggage; but he said it was all wrong, and they ought to have made me pay for every mile they carried it. It was near train time, so I paid the 80 cents demanded, and told him I would refer the matter to the general baggage-master, on my return. To my surprise, the latter gave his decision in accordance with that of his under officer. I felt sure I was right and they were wrong; but I remembered my experience with the crooked crank, and took it very good-naturedly, and asked him if he wished to have it go out that they refused to accept bicycles as baggage, even when taken apart and packed in a trunk. The change in my attitude seemed to have the effect of producing a change in the railroad official. He said it would undoubtedly make a difference, having the wheel so it could be handled like any other trunk or baggage, and finally said my 80 cents would be returned to me. At first I thought he would hand it right over there; and when he explained to me that it would have to go through a system of red tape with the necessary vouchers, and be sent me by mail, I began to be impatient again. But a better spirit triumphed.

And now, friends, I want to put in right here a little bit of defense for the railroad companies. I wish to do so because I know that many who have little to do with railroads do not understand the matter. I have sometimes told you I could not manage a business, especially a garden, unless I could go over the premises every day, or, still better, *every hour*. Now, no one man owns a great railroad. It is owned by a company of stockholders. A great part of the work is done hundreds (sometimes thousands) of miles away from where the boss or bosses live. Strict rules have to be made, and measures taken so that property or money can not be wrongfully appropriated. Let me illustrate the way dining-cars are now managed. You sit down to the table, and the porter gives you a bill of fare showing the price of each article; then he gives you a printed blank and pencil, and desires you to write out what you want. If you tell him to bring you a forty-cent beefsteak and a cup of coffee he will say, "No; you must write it down." This printed form also directs you to pay the money to the dining-car conductor. None is to be given to the porters. Then another printed list, giving the price of each article, is handed you, and the conductor punches out the price of just what you have ordered. All this is so that the proper officer can review the entire business of the dining-car. The cash handed over tallies with all these slips, and the whole thing is so arranged that any kind of crookedness is almost impossible. You notice the street-cars are managed in a similar way. No money is paid to anybody without a record. Ingenious machinery, with the assistance of the great purchasing public, keeps it all straight. Now, the baggage-master who took my 80 cents can *receive* money, but he can not pay any back; neither can his superior officer pay any back. Somebody might say, "Well, that is the last you will ever see of your money." Not so, my friend. The Northwestern can not afford to do business in that way. I am sure the 80 cents will be forthcoming, although it may take several weeks for it to get around.

While in Omaha I wanted to make a trip to Mitchell, South Dakota. In order to catch my train I was obliged to leave the exposition grounds during a very entertaining exhibition given by the life-saving crew. I calculated so as to have plenty of time to reach the station; but when we got almost there the car stopped. I told the conductor I wanted to catch a certain train. He said he would do his best to make it. Just as I thought we were all right, he said he was sorry to tell me that they could not go another inch. For some reason, unknown to him, "the stuff was off." "Stuff," I found, was with him a short word for the electric current. I told him I thought I could catch my train on foot. He directed me where to go, and said if he got started so as to catch me he would do so. I found my train standing at the depot; but my wheel-trunk was not checked. A long string of other passengers

were standing in a row at the counter, waiting to have their baggage checked. I found out by inquiry that none except myself were going to take *that* train, and so I asked the baggage-man to be kind enough to wait on me without taking my turn as usual. He was in the act of doing this when some indiscreet passenger who happened to be looking over my shoulder declared that the agents at that depot were the slowest set of fellows on the face of the earth. The man at work for me overheard it. He was a red-headed Englishman (no disrespect intended here for red-headed people nor for Englishmen either; in fact, my wife would feel hurt in the latter case). He turned around with an angry face, and with a gleaming eye told me I had better get somebody else to do his work if his motions did not suit me. My train was starting, and there was no time for an apology; but, oh how wicked it was for the man at my shoulder to make such a remark! Even if what he said had been true, it only made matters worse. If this world could only learn not to make unkind remarks that do no good, what a lot of hard and unpleasant feelings might be avoided!

While in Livingston, Montana, I became acquainted with a baggage-man. His wife's mother keeps bees; and when he saw "A. I. Root" on my wheel-trunk, he and I were old friends. He told me how exceedingly difficult it was for him to get baggage off when people all seemed to think it was right and proper to wait until the train was in before they looked after *their* baggage. Do not quarrel with the railroad officials, friends. Adapt yourselves to the circumstances. Put yourself in the places of these officials. I know they are not all good men, and not *always* doing their best; but if we who profess to be Christians would pray for the direction of the Holy Spirit that we may make them better instead of worse, oh what a change there would soon be seen all around!

Now, I have not made half the applications I wanted to. There are husbands and wives who permit Satan to suggest that they can't get along with each other; yes, and after the two have unitedly brought up a family they sometimes have quarrels. That grand poem by Will Carlton, right along in this line, nobody knows how much good it has done. and there are fathers and sons who can not get along together; and if you inquire into it you will find many times the reason they can not get along is just because the boy *is* a "chip of the old block." Let me say to the father, and to the boy too, remember the story about the bent bicycle-crank. Sometimes *brothers* go to law because they can not agree. Whatever you do, dear brother or sister, do not quarrel with a relative. Before you think of going to a lawyer, give to the other *all he will take*. Now, please do not understand I am making a fling at lawyers, in the above. Some of the best men I know of are lawyers. I know these men have often urged their clients to settle things in a peaceable and inexpensive way. In fact, I believe our best and ablest lawyers always do this now. But when people are contrary, and will not be advised, then the lawyers will undertake to do the best they can under the circumstances. Of course, we must look out for ourselves. If you do not wish to be disappointed in charges by lawyers, railroad men, doctors, or anybody else, insist on knowing beforehand what the thing is going to cost. Have an agreement, if possible, with everybody, before setting such party at work; then if things go wrong, cheerfully adapt yourself to the circumstances and conditions, and make the best of it, and live at peace with all men, so far as in you lieth.

TEMPERANCE IN MEDINA.

Since the issue of Our Homes for September 15, quite a number have inquired anxiously about the outcome of open saloons in Medina. May God be praised that those on the side of righteousness were greater than those who were working against us. Out of 561 ballots, 320 were "dry" (or opposed to letting saloons come back to our village), and 241 were in favor of letting them start up again after a cheering absence of over twelve years. The contest was the most spirited of any thing of the kind I have ever known in this place. The wets claimed to have been at work for a whole year; and had they succeeded in getting a vote at the time they called for it, no doubt the saloon would have gained the victory. Our town council, however, managed to put them off so as to give the temperance people a chance. Our ministers got together and arranged for a series of union temperance meetings, holding one every Sunday night at different churches as long as the campaign lasted. As is usually the case, a great many good people would not attend. To meet this difficulty we had some of the sermons printed in the form of bulletins. The paper that I sent out for our employees (given in our issue for Sept. 15), was called Bulletin No. 1. The week before election, the women of Medina voted in order to show the council what *they* thought of the matter, and we were rejoiced to find about 375 voted against the saloon, and *not one* for it. May God bless the women for the stand they took. Then our high school, and, in fact, all of our schools, followed suit, and the vote of the pupils was practically unanimous, although a few of the boys would vote as their fathers were going to vote, in spite of all the mothers could do.

Every argument was met that the saloon advocates could advance. Lists were made of our people, both wet and dry; and those who seemed inclined to vote wet, or who were indifferent, were visited by temperance people who would be most likely to have influence with the person in question. At the present writing I have not been able to find that a single one of our employees voted "wet," although quite a number stayed away from the polls and did not vote at all. Our people marched in procession to the polls; and as there were about a hundred of them, they were, in God's providence, enabled to turn

the scale on the side of humanity. In such a contest as this, we of course did not want anybody to "crow" over the vanquished foe as they do in political times. Our ministers enjoined us to be very careful about doing any thing that might provoke an antagonistic or bitter spirit. In a work of this kind, gentleness and a kind brotherly feeling, even for those who are in error, are the weapons to be used.

On page 704 I published an account of the arrest and imprisonment of Rev. G. J. Raynor, of Columbus, O. It is time now to give you the final outcome of the matter, an account of which I copy from the *American Issue* for September, 1898:

THE CASE AGAINST MR. RAYNOR DISMISSED.

The suit for criminal libel instituted against Rev. Gilbert J. Raynor by Patrick Kelly, superintendent of police of Columbus, was dismissed for want of evidence after the prosecution had offered all their testimony. This was just as every one expected it would end Even the lawyers for the prosecution knew they had no case, and so expressed themselves before the case was called. The facts are, the administration was so enraged at the revelations made by Mr. Raynor that they lost their heads, and, as is usually the case with such people, instead of setting about to correct the conditions that they and everybody else in Columbus know exist, sought to wreak vengeance upon Mr. Raynor for revealing the corruption that is rampant. They arrested and falsely imprisoned him, and in the most malicious manner attempted to persecute him. Mr. Raynor has instituted a $20,000 damage suit against Patrick Kelly for false imprisonment and malicious persecution. These jugglers with justice will yet find that arresting men and thrusting them in jail for uncovering their official deformities is possibly not quite as funny business as they at first supposed it would be.

OUR BEAUTIFUL FALL.

At present writing, Oct. 13, we have not had a bit of frost. Tomatoes, lima beans, cow peas, and last, but not least, potatoes, are just as fresh and luxuriant as they were in July—yes, even more so, because we now have rain and then we didn't. Manum's Enormous and the Craig potato are just doing wonders. The ground has been breaking open to such an extent with the great tubers that we hoed fine dirt into the cracks to prevent the sun from turning them green. Just think of it! hoeing potatoes in the middle of October, and the hoeing has really done them good. We could not hoe much, however, except where the stand was so poor that the hills were quite a little distance apart, because the rank vines run out in every direction. We had one piece of Manum's Enormous where the potatoes had hardly half covered the ground because so many did not germinate during the July drouth, and I meditated planting beans or something else in the missing hills. I am glad now, however, that I did not, for the ground is just literally covered like a swamp, with great beautiful potato-vines. Our Bovees, planted very late, are some of them still green; and the New Queens, planted the first of April, that took on a second growth, are just putting in their best licks away here in October. There is going to be an enormous crop on the ground, but I suppose they will be awful-*looking* potatoes. My impression is, however, they will answer just as well for seed, for it is the peculiar season, and not the habit of the potato, that makes them prongy.

The cow peas are making pods at an amazing rate; and squashes and pumpkins are producing a crop that is almost unheard of before. Cauliflower and cabbage are also promising great beautiful heads away along after everybody else has quit gardening. We shall have to look out for the frost when it *does* come—that is all.

COW PEAS.

Ed. Gleanings:—I noticed with pleasure the article in GLEANINGS on cow peas, by Mr. Benson and the editor; and as I lived in Illinois many years, and eighteen years in the South, I feel like speaking a few words concerning cow and field peas.

There are many varieties of the cow (or field) pea as there are also of the English pea. There is the large white pea with the black eye, called by some the Crowder. Then there is the shaded, called Whippoorwill pea, both bunch and very early; the Black pea; the Clay, Red Ripper, Unknown, Snake, and many other kinds. Now, it is a fact that not many people know that there are some of those cow (or field) peas that do better in the Middle States and some in the Northern States than they do in the South; that is, they mature more peas, and, as suggested by Mr. Benson, bloom and bear more freely in cool weather. The Clay pea will make more peas in Kentucky and Indiana than it will further south. The Snake pea makes 30 feet of vine here, but few or no peas. The Whipporwill and Crowder do well in Southern Illinois, and I suppose some of the rest would, but I have tried only these two kinds since I came south. I would suggest that all who are interested in forage-making and restoring worn-out soil, and making rich soil richer, try several kinds of peas in the Northern and Middle States until they find some variety that is specially adapted to their climate. I have seen from 200 to 300 pods on a single vine when it ran up and over a dead peach-tree or some other support where it could spread well; and some of the vines were 20 to 25 feet long. The bunch kinds make the best hay, as it cures quickly and forks better. Sow on oat stubble; or wheat stubble is probably better for hay. Sow in corn. When you lay it by it will always pay in stocking and enriching land. In most cases it will give a fair yield of peas. I would suggest to any one desiring seed peas, that Memphis, Tenn., is a fine market to find them in season.

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Crystal Springs, Miss.

A SINGULAR GREENHOUSE AT YELLOWSTONE PARK.

Near the large hotel at Upper Geyser Basin is a curiosity in the shape of a greenhouse. As it was difficult to get material for such a structure in this remote place, the walls are principally if not entirely made of slabs that were picked up, probably from timber used in making the great hotel. The walls are all of slabs, and the only glass in the structure is in the roof, which all slopes in one direction. The owner told me that, at the time he made it, he did not know enough about greenhouses to even place it so the roof would slope toward the south. Perhaps it is just as well that he didn't, for it would have been much hotter in the summer time. The glass for the roof was evidently pieces picked up, for the lights were of many different sizes. Although the temperature in that locality goes down low enough to freeze mercury in winter, the house was not

made anywhere nearly as tight and secure as we make our greenhouses here in the East. The source of heat is one of the boiling hot springs, and the house is filled with steam more or less at all seasons of the year, winter and summer. The heat of the spring warms the house sufficiently. Now for the wonderful results:

At the time I was there in August, cucumbers and tomatoes were the principal crops grown. The owner had evidently given it but little attention, for the beds were not all occupied. Although I did not take any measurement, I should guess the house was 20 feet wide and 40 or 50 feet long. One single cucumber-vine occupied a great part of it. He told me this vine had been growing winter and summer for two seasons, and from the looks of it I should say his statement was true. The soil was pretty rich in the beds, made so with something that looked like sheep manure. He said he did very little watering, and, in fact, he thought the steam that was all the while making every thing drip would keep things growing without any other irrigation. There were green and ripe tomatoes at the time, and lots of cucumbers setting, but none quite large enough for the table. These were picked as fast as they became of suitable size for the big hotel close by. I happened to look down under the bench, however, among the vines, where a very fine cucumber had grown unobserved. My good friend very kindly presented this to me as a reward for my careful scrutiny.

This large cucumber-vine did not seem to be all growing thriftily; but new bright green thrifty shoots were starting out here and there, blossoming and bearing cucumbers. One thing that surprised me was that neither in Florida, California, nor in Bermuda did I find a cucumber-vine that had gown continuously as this one had. Will some of the friends in these tropical climates inform me whether it is usual to find cucumber-vines more than one year old bearing continuously?

Now, here is the astounding part of my story: Nobody stays in Yellowstone Park over winter; but a government official, in making explorations on snowshoes, came to this greenhouse in the depth of winter, and found cucumbers of all sizes — a great abundance of them — growing quite luxuriantly. Notwithstanding there are openings in many places where I think a cat might jump through, the hot springs under the bench where the cucumber-vine grows had furnished heat and steam enough to crowd the cold out. When shut up for winter I suppose the steam would be forcing its way out of all the crevices so as to keep the terrible — not *zero* weather, but weather away down below zero—out. From the looks of the vine I feel sure it has been growing, certainly all the past winter, in the way my informant describes. Now, this being true, why in the world is not the house so hot during July and August as to kill every thing? Well, to tell the truth, I can not answer. There is no ventilation at all in the roof. The only ventilation is through a small window in one gable end, and a good-sized door in the opposite end, and the slope of the roof is, I think, toward the northeast. I presume all plants will thrive as well as tomatoes and cucumbers. Grand Rapids lettuce was doing tolerably well. Very likely the moisture and heat combined would produce too rank a growth for many vegetables to bear fruit properly. Of course, this locality would not be the place to grow crops in winter for our large cities, for it is almost a hundred miles from any railroad station; but as there are hot springs scattered through Idaho, Wyoming, and Montana, I think there is a wonderful opening for somebody who will find and buy one of these springs near a railway station. In fact, I was told a movement was already on foot for such an enterprise. When I first visited California I continually protested because nobody was making use of this kind of heat for growing tropical plants. At San Jacinto, Cal., a hotel sanitarium was running hot water long distances through pipes, to cool it off so they could use it for drinking and other purposes. At the same time, this hotel was paying tremendous prices for firewood to heat their *stoves* in winter. The hot water that they cooled off outdoors could have been conducted through their hotel almost as cheaply as where I found it.

In some of the European countries, I understand, they are using hot springs for growing beautiful pineapples. Why can not somebody do the same thing in our Western States? Can anybody tell me how much progress has been made along this line? If such a work is not "High-pressure Gardening" in very truth, then I do not know where you will find it. You may be aware that I have been using exhaust steam for these many years past in a similar enterprise. But one great trouble has been that my stuff would get too hot; and during our zero weather my strawberries would be, figuratively, cooked on one side and frozen on the other; and yet this greenhouse that I have described seems to have gotten around all of this trouble. I could not dispute it, for there was that gigantic cucumber-vine. I suppose many of our readers have read of the success recently obtained by the Missouri Agricultural Station in forcing rhubarb in the open ground by running steam between the plants, say once or twice a day during severe weather. This warms the ground to such an extent that stalks were forced fit for market, in the open air, without any covering except coarse manure.*

*A full report of this will be found in the *Market Garden* for June, 1898. Address Market Garden Co., Minneapolis, Minn. The plan has been worked successfully for two winters by J. E. Whitten, horticulturist, Columbia, Mo.